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THE TREATMENT OF FEMALE STERILITY*

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During the past fifteen years the factors concerned with the problems of sterility have been studied with an intensity that has achieved very definite progress in this vital problem.

The indifferent attitude formerly assumed by the practitioner who was consulted because of infertility, has changed to one of extreme interest, especially as it pertains to the gynecologist and obstetrician. This increasing interest brightens the outlook for future progress. Undoubtedly this increase of general interest can be attributed in part to the effect of the World War and especially must this be true in France and Germany.

It seems that, inasmuch as the problem is a universal one, a short consideration of the treatment of sterility in the female might be of value and might serve to stimulate further interest in this condition.

Two great advances have been made which have aided us more clearly to direct the line of treatment. First, advance in technic of investigation by which the patency or closure of the Fallopian tubes can be proven. We refer to the Rubin test and to Lipiodol injection for localization of the obstruction. Secondly, to the advances made in the field of endocrinology, notable among which is the discovery of the follicular or female sex Hormone and the study of the relation of thyroid and pituitary conditions.

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As one attempts to correlate and classify the methods of treatment, both past and present, the problem becomes increasingly complex. Rational treatment of necessity depends upon knowledge of the etiology and over forty causative factors are now known, any one or combination of which may produce sterility[1].

In this consideration we shall assume that the fertility of the male involved has been proven.

The causes of sterility may be divided into two groups:

First—General or constitutional.

Second—Local or mechanical.

GENERAL OR CONSTITUTIONAL CAUSES

Frank[2] estimates that only 20 per cent of all sterility is due to general or constitutional causes and that they are responsible for 25 to 30 per cent of sterility in the female. He considers these conditions to be largely due to endocrine disorders and distinguishes four groups or types of individual:

1. The typical, normal feminine in which no definite anomalies were demonstrative.
2. The infantile.
3. The neuter.
4. The pseudo-masculine type.

The most reliable signs can be obtained by examination of the secondary sex characteristics—voice, distribution of fat and hair, configuration of breasts and nipples, and the psyche. These, in conjunction with examination of the pelvic organs, complete the study of the degree of the development. The deviations commonly seen are the long limbed eunuchoid woman; the florid-complexioned, hirsute, masculine type; and the short, obese, dull-complexioned, scanty-haired woman. It must not be forgotten, however, that in spite of these anomalies such women may conceive if mated with a male of high fertility.

OBESITY

Obesity is probably the most common constitutional finding. Dickinson[3] found 27 per cent substantially overweight in 239 cases of sterility. Of these nearly half had gained twenty-five pounds or more since their marriage. In all but four, other cause of sterility were also discovered. He found that 25 per cent had defective development and amenorrhea which, he thinks, indicates the relation between ovarian or uterine defect and obesity. In this type of case the use of the follicular Hormone as reported by Hirst[4] would be indicated. It is also necessary to study carefully the condition of the thyroid and pituitary glands. Meaker[5] estimated that disturbances of these glands occur in the following ratio: anterior lobe of the pituitary, 60 per cent; thyroid, 20 per cent; ovarian deficiency, 10 per cent. Litzenberg[6] has called attention to the frequency of low metabolism in sterility and reports excellent results from the use of thyroid. It appears that a normal metabolic rate is necessary to conception and the continuance of pregnancy, and he calls attention to the fact that lesser degrees of hypo-thyroidism, often with little clinical evidence, are apparently a cause of sterility. It therefore seems imperative that all cases of sterility, both male and female, should have a determination of the basal metabolic rate so that intelligent thyroid medication can be carried out when indicated. Very little success has attended the treatment of pituitary deficiencies thus far, probably because of the lack of an efficient preparation that can be used by mouth. One of the authors has under observation at the present time, a sterile woman, who at the time of her first interview, weighed 225 pounds which was an increase of 100 pounds since her marriage. She had suffered from amenorrhea. Under thyroid and pituitary medication, and with proper diet and exercise, she is losing a half pound a day, and within one month after treatment she menstruated.

DIET AND EXERCISE

Particular attention should be paid to the diet in all cases of sterility. While in a certain per cent of obese patients, the metabolic rate, general examination, and pelvic findings are normal, yet the association of sterility and obesity is too striking to be disregarded. Kennedy[7] called attention to the observations of animal breeders concerning diet. It is their custom to employ forced feeding just before breeding time. They have also noticed that lack of exercise results in lack of fertility. Kennedy believes that obesity is more often due to outside causes—exogenous obesity—than to endocrine disturbances. Macomber[8], after a long series of experiments with rats, concluded that defective diet may cause decreased fertility but that the kind of dietary deficiency is not important. He believes that the diet affects sterility through its general effect on the health of the individual.

A regime of diet and exercise that will tend to restore the individual to normal

weight and activity should increase the fertility of that individual. In the obese this means a high protein, low caloric diet which contains an ample supply of mineral salts and green vegetables.

In cases of under development, the diet is aimed at the improvement of the general nutrition—a high caloric diet with an abundance of protein. Rest, over-feeding, sun baths, and all roborant treatment should be used.

In all groups, but in the under-developed especially, adherence to principles of good hygiene, proper social life, freedom from worry and overstrain, and regulation of the sex life are beneficial. Too frequent sexual indulgence is common among those who are strongly desirous of parenthood for they believe that such frequency favors conception, while in reality prolonged periods of sexual abstinence may in itself restore fertility.

LOCAL TREATMENT IN HYPOPLASIA

At present the Hormone and endocrine treatment does not prove wholly efficient in the treatment of cases of arrested development although it still holds promise of success with its further study as we progress in knowledge. In addition local measures are employed by many. Norris[9], in 1918, reported on the use of radium in so-called stimulating doses for cases of ovarian insufficiency with scanty menstruation, dysmenorrhea, and sterility. Of his 16 cases the dysmenorrhea was lessened in ten and cured in two. Five cases complained of sterility and one of these became pregnant. Caufman[10] reported one similar case with cure of menstrual disturbance and resulting pregnancy.

Rubin[11] has reported twelve cases of sterility, nine of whom became pregnant following treatment with small doses of X-ray. However, all these cases were also given gland therapy. The result is, therefore, not conclusive. He drew attention to the fact that in eight of the nine successful cases the ovaries were found to be enlarged on examination and suggests that this may be a point for selection of cases.

Castano[12] and others have treated congenital hypoplasia with the diathermy. He obtained satisfactory results in cases in which the uterus measured not less than 5 cm., if the walls were not too thin and the mucosa not too atrophic. The uterus enlarged after ten treatments and menstruation became normal.

THE MARITAL RELATION

Closely related to both the constitutional and local causes of sterility are the results of abnormal sex life. German authors have been quite positive in the view that frigidity, lack of orgasm, and other functional abnormalities are of considerable importance in the production of sterility. One scarcely needs mention the role vaginismus, dyspareunia, and other gross disturbances might play, but one must not neglect the less obvious conditions, the results of which may be equally as disastrous. Reynolds[13] is of the opinion that sterility may be due to mistakes in the marital relation. These consist chiefly in the production of excessive congestion and subsequent sterility. Frequent and habitual caressing producing excitation without orgasm is frequently a cause of local disturbance; want of simultaneous chronicity in orgasm due to local irritation in the male causing premature ejaculation, due to the practise of withdrawal as a preventive measure which usually deprives the female of orgasm, or due to the presence of chronic congestion in the female organs which sometimes produces a condition of desire but in which orgasm fails to appear, all may tend to produce local changes tending to sterility. Proper instruction in the physiology of sex life, less frequent coitus, and local measures favoring depletion may serve to correct the difficulties. Also one must not neglect the psychic causes of failure, the treatment for which lies in instruction and suggestion.

LOCAL OR MECHANICAL CAUSES

In most cases of female sterility one or more local causes are found. Seventy to seventy-five per cent of cases fall into this group. For practical considerations these may be classified as:

1. Causes which prevent the sperm being deposited in the cervical canal—called by Meaker "Faults of delivery-reception."
2. Conditions preventing the passage of sperm through the cervix.
3. Causes which prevent the sperm meeting the ovum in the tube—
   (a) by obstructing the passage of the sperm upward.
   (b) by interfering with ovulation and migration of the ovum downward.

I. Disturbances of delivery—reception due to female causes.

In order for conception to take place

normal active sperm must be deposited in the cervix in large numbers. Any anomaly, congenital or acquired, which interferes with the act of coitus may prevent conception by preventing the sperm from reaching the cervix. Atresia of the vagina, imperforate hymen, shallow fornices, and other more rare congenital deformities may be found. These constitute a very small percentage of the cases studied and are usually amenable to treatment. Resection of imperforate hymen, vaginal widening operations as performed in Germany[14] and lengthening of the vaginal wall by the simple method of making a transverse incision and uniting the wall longitudinally are all procedures the indications for which are clear and which should yield excellent results when used in properly selected cases. It is the indiscriminate and empiric employment of operative interference that has been responsible for the failure of some valuable procedures. In case of failure in these attempts repeated trials by artificial insemination are indicated.

II. Hostility of the cervix.

One obtains the most helpful information by the post-coital examination. If no spermatozoa are found there is some cause preventing the deposit of sperm in the cervix. If normal spermatoza are found the cause is at once localized to the supracervical region. Perfectly normal sperm may be deposited in the cervix but they may be killed or their further progress prevented by the condition of the cervix uteri. Abnormal conditions in the cervix were early recognized as causes of sterility. Congenital anomalies such as elongation, anteflexion, and pin hole os, however, were considered as entities and as a result treatment yielded but poor results. It is our opinion that the long, narrow, sharply anteflexed cervix is only part of a general hypoplasia of the organs of reproduction and is an indication for endocrine and local stimulative treatment instead of operative intervention. The patency of the cervix can readily be determined by passing a small Hegar sound. It seems unreasonable to assume that a cervical canal large enough to permit the escape of menstrual blood is mechanically impenetrable to the spermatozoon, yet pregnancy frequently follows the passage of a sound. Hunner and Wharton[15] treated cervical stenosis 55 times with 18 resulting pregnancies. These results are probably due to the establishment of proper drainage of the genital tract.

More important is the character of the cervical secretion. Meaker suggests the investigation of the cervical secretion along the following lines: 1, Viscosity; 2, presence of leucocytes and bacteria in the stained smear; 3, the chemical reaction.

Sims[16] recognized the importance of the cervical secretion in the study of sterility and recommended the examination of the secretion after coitus to determine the presence or absence of living spermatozoa. He advised trachelorrhaphy as a method of treatment. Sturmdorff[17] stated that "A diseased cervical mucosa is capable of immobilizing and destroying spermatozoa," and recommended his method of tracheloplasty as an aid in the treatment of sterility. Curtis[18] stated that gross lesions of the cervix with purulent leucorrhea may prevent impregnation. Hostile cervical secretions are usually the result of an old gonorrheal endocervicitis or the infection and erosion accompanying lacerations due to childbirth. Retained secretions resulting from poor cervical drainage may become spermaticidal. Stellwagen[19] found diphtheroids in the cervix in one case of sterility due to purulent leucorrhea and was able to effect a cure by means of local treatment and an autogenous vaccine. Conservative measures, preferably radial cauterization with the electro-cautery is the treatment of choice. In case this fails after a thorough trial some form of tracheloplasty should be considered. Artificial insemination may be tried in the event of failure of all other methods. We have found it successful when local treatment failed to cure the diseased cervix.

Also, one must not lose sight of the relation between cervical and tubal infections. Smiley[20] has called attention to the fact that since practically all cases of tubal disease are the result of infection from below it would be of no great value to attempt reconstructive work on the tubes until the focus in the cervix has been removed.

THE UTERUS IN STERILITY

Probably the position of the uterus has little to do with impregnation. Hunner and Wharton concluded that uncomplicated retroversion is not a cause of sterility. Functional disturbances with resulting congestion might interfere with implantation. Endometritis in itself is rare and is seldom a sole cause of sterility. Fibroids do not necessarily cause sterility except when they cause excessive pressure, although Graves[21] believes that sterility oc-

curs in about 30 per cent of women who have fibroids.

Hypoplasia, however, is an important and frequent factor; true infantilism is rare. Meaker takes the ratio of the length of the supracervical uterus to the cervix as an index of the degree of development. The infant ratio is 1:2, the normal adult 2:1. All degrees of development may be found.

THE FALLOPIAN TUBES

Recently the interest of most workers in sterility has been focused on the diagnosis and treatment of tubal conditions. With the advent of the Rubin[22] test in 1919 an accurate, relatively safe and practical method of determining tubal patency was presented to the profession. Universal interest was aroused at once and hundreds of cases were reported within the next few years. The mystery of patency of the supracervical tract began to clear. That the procedure had some therapeutic value soon became evident acting either by the straightening of kinks, blowing out fine mucous plugs, or separating slender adhesions. The tubes in some cases opened and pregnancy resulted. Douay[23] found that in 100 cases pregnancy followed in eight. Graff[24] obtained a result in 10.1% in a series of 376 insufflations and Rubin[25] now states that 14.5% have become pregnant following insufflation in a series of 2,000 cases.

Some have recommended insufflation following coitus in the hope of driving spermatozoa into the tubes. We have tried this a few times without success but it is our opinion that the danger of infection is too great to warrant frequent use of the procedure. Sellheim[26] went so far as to devise an apparatus by means of which the spermatic fluid can be injected with the stream of gas.

With the continued use of gas insufflation our knowledge of the physiology of the tubes was increased. Rhythmical contractions were noted and recorded on a kymograph. The tubes were found to be impermeable at certain periods in the menstrual cycle (physiologic impermeability) due to the swelling and thickening of the uterine mucosa which may obliterate the orifices of the tubes at the uterine ostium. And, also, the condition of tubal spasm was discovered. This is probably produced at the uterine ostium where the muscular coat of the tube is thick and resists distention. Meaker considered this a possible cause of sterility and advised the use of Benzyl Benzoate as an antispasmodic after intercourse in such cases. Douay had five successful cases with this method.

While the Rubin test determines the patency or occlusion of the Fallopian tubes it fails to furnish important information concerning the point of obstruction in cases with closed tubes—a point that is absolutely essential before a rational method of treatment can be planned. In 1923 Kennedy[27] reported on the radiography of closed tubes using sodium bromide for injection. In 1925 Carlos Heuser[28] used iodized oil to visualize the uterine cavity for the diagnosis of early pregnancy and in 1926 Carreras[29] employed the oil to visualize the uterus and tubes. The procedure soon came into frequent use and large numbers of case reports can now be found in the literature. The point of obstruction in occluded tubes can be definitely localized by the injection of iodized oil and roentgenography. In addition one can often obtain some idea as to the cause of obstruction. Further, the oil is thought to have some therapeutic value due to the slow liberation of iodine as suggested by Jarcho[30] who believes that it may have a favorable influence on the pathological conditions in the tubes. Cotte and Pierre[31] have injected the oil in 20 cases of acute adnexal inflammation without harm and believe it may be beneficial in some cases. We have had one case that became pregnant shortly after the transuterine injection of lipiodol, but other factors were also receiving attention in this case so the result is not conclusive.

The surgical treatment of closed tubes has been attended with very little success in the past. Undoubtedly a large proportion of the failures can be attributed to inaccuracy in diagnosis especially diagnosis of the point of obstruction. Those cases in which occlusion has occurred at or near the fimbriated extremity are more favorable for treatment than those in which the occlusion is in or near the narrow interstitial portion.

The history should be studied thoroughly for evidence of previous gonorrheal infections, post-partum or post-abortum inflammatory disease, suppurative appendicitis, tuberculosis and neoplasms. It is obvious that no active treatment should be attempted on cases showing evidence of acute or sub-acute infection. Douay advised diathermy, massage and hydrotherapy in those cases of old infection with partially occluded tubes.

Solomon[32] divides the operative proce-

dure into four classes according to the location and extent of the lesion:

1. Release of adhesions at the fimbriated end of the Fallopian tube.
2. Resection at the fimbriated end of the tube.
3. Operation for disease at the isthmus of the tube.
4. Operation for disease at the uterine end of the tube.

If tuberculosis of the tubes is present they should be removed completely. If there are simple adhesions at the fimbriated end, these may be gently freed and a strand of No. 2 catgut placed in the tube to prevent it closing again. If more extensive disease is present the fimbriated end may be resected. When the disease is in the isthmus the diseased portion should be resected and an end to end anastomosis done, but the results are not so hopeful. When the disease is in the uterine end of the tube the diseased portion should be removed, the uterine ostium exposed, the uterus bisected and the tube sutured in place.

Numerous other operations have been used such as the salpingorraphie of Pozzi, the method of Clado, and the tubo-uterine implantation as used by Ries and Watkins. Grafting or implantation of the ovary into the uterus does not appeal to us as being based on sound physiologic principles.

SUMMARY

Successful treatment of female sterility depends primarily on an accurate diagnosis of the etiology.

It appears that in approximately 25 per cent of cases, sterility in the female is the result of abnormal constitutional factors.

In the greater number (about 75 per cent) it is due to the operation of local or mechanical causes.

In any given case the causes are frequently multiple and while the treatment of mechanical conditions would seem most important, the general physical, mental and social problems must not be neglected.

Recent advances in diagnosis and refinements of surgical technic enable one to offer those whose sterility is of tubal origin some definite hope of improvement through reconstructive surgery.

With the modern treatment of cervical infections by the galvano-cautery and diathermy and by proper attention to genital drainage may we not hope to definitely decrease the incidence of tubal infections and tubal sterility?

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DISCUSSION ON PAPER BY ALEXANDER M. CAMPBELL, "THE TREATMENT OF FEMALE STERILITY"

Dr. Harold Henderson (Detroit): I enjoyed hearing the description by Dr. Campbell very much. I am sure he has done more of this work than anybody else in the state. He has gone into it much more fully than the rest of us have. The

newer studies of sterility have taught us many things. In the first place, they have taught us more accurate diagnosis. The armamentarium of the surgeon in the past was dilatation and a curettage when a patient reported sterility. Many women have been subjected to needless operation for correcting a malposition of the uterus. It is surprising how many of these women have husbands who have no spermatozoa whatsoever.

One of the first things we must learn to do, despite the fact that we have learned so much about this subject in the last year—there are many of us who must get the lesson home that the husband must have motile spermatozoa before you attack the problem.

Probably the biggest advance made in handling this type of case is in the perfection of the Rubin test. By means of the Rubin test we can, of course, tell whether or not a patient has patent tubes. It is evident she cannot become pregnant if the tubes are not patent. If there is failure of passage of gas through the tubes we can pursue the subject a little further and inject lipiodol and locate the point of obstruction. If there is an obstruction we can then devise, if it seems feasible, an appropriate operation to correct the particular type of obstruction that we may be dealing with.

In other words, we are dealing with an entirely different kind of operation for sterility than we were ten or fifteen years ago. In the past practically every operation consisted of a dilatation and curettage, or a correction of a retroversion. We are beginning to develop the technic of salpingostomy. That is the only operation justifiable now. The cases of sterility that have been cured by means of curettage probably could have been corrected by other means or by no treatment at all.

I think we must compliment Dr. Campbell again on the thoroughness and broad-mindedness with which he has approached this subject.

Dr. H. Wellington Yates (Detroit): I am always interested in any subject that Dr. Campbell brings out. As someone has said, I suppose he has done a little more work than anybody I know in the immediate vicinity. The question of these radical operations that our friend from New York does and the results that he has from them are very surprising to me and very inspiring likewise. I have heard his paper two or three times and I am always inspired by it. The particular reason I wanted to get up for is the point that Dr. Morris brings out in the Solomon operation that Dr. Campbell has referred to. It seems to me the wisdom that Dr. Morris uses in this is in splitting the tube clear up to the uterus or thereabouts because within two centimeters in the tube outward from the uterus is the most constricted portion of the tube. Unless you go beyond this place there is very little hope, because in a great many cases there is where the constriction takes place.

I particularly wish to call attention to the fact that there is within about two centimeters of the uterus that you cannot get a probe through even in its normalcy, to say nothing of this constriction that would take place from even a low grade inflammation.

REPLY TO DISCUSSION ON "THE TREATMENT OF TUBE STERILITY"

Dr. Alexander M. Campbell (Grand Rapids): I am sorry that I did not have more time to discuss some of the phases of this subject more thoroughly. If what I have said, however, will stimulate practitioners to interest themselves in the problems of sterility my presentation has been worth while.

I do not want it to be understood that our experience in this subject is greater than any one else in this state. We have, however, spent considerable time and study in the problems of sterility and are increasing our knowledge in these cases by rather intensive study of each individual.

Reparative surgery of the tube is more successful when it is directed to the fimbriated extremity.

Dr. Yates states that there is a portion of the isthmus of the tube that cannot be probed and he is quite right. The interstitial portion is of small diameter, one-half to one mm. only and is often tortous. Sometimes its course is marked by sharp angulations. In less than half of the cases it rises in a smooth curve. It is this portion of the tube which seldom admits the passage of a probe; indeed considerable damage may be done in attempting it. Likewise attempts at reconstruction of this portion are rarely successful.

One practical point that I would like to bring out is in reference to the most favorable time for insufflating the patient, and that time is five or six days after the cessation of menstruation.

There is a "physiological impermeability" of the tube previous to menstruation at which time frequently the gas will not pass through the tube. This is a practical point that should be borne in mind by those who are commencing to use this important diagnostic procedure.

TUBERCULOUS ENTEROCOLITIS

Frank Smithies, Morris Weissman and Frank Fremmel, Chicago, conducted a gastro-enterologic survey for definite evidence of the incidence of digestive dysfunction among the patients of a tuberculosis sanatorium. The summary of symptomatic anomalies was: dysphagia (laryngeal or tracheal disease?), 15 per cent; gastric symptoms (nausea, vomiting, pyrosis), 40 per cent; peptic ulcer syndrome, 3.5 per cent; disturbances in bowel, 79 per cent; normal stool frequency, but dyspepsia present, 19 per cent. In this group there were 44 males and 36 females. The average age approximated 32 years; the youngest patient was 6, and th eoldest 70 years. The average duration of the tuberculosis (usually, initially, pulmonary) was 2.6 years, the shortest duration being two months and the longest 14 years. At the time of study, the sputum in 49 cases contained tubercle bacilli; in 17 complement fixation tests were positive; in 12 the sputum was bacili free, but in 10 of these tubercle bacilli had been present in the sputum or positive complement fixation tests had been obtained. The two exceptions were instances of characteristic tuberculous bone lesions. In the entire group there was a family history of tuberculosis in 23 (28.7 per cent). The authors discuss the alimentary tract physiologic function affected by tuberculosis; location of enteric lesions; modes and routes of infection; allergic manifestations in tuberculous enteroculitis; clinical groupings and clinical summaries; roentgen studies and the mode of management.—A.M.A.

THE VALUE OF X-RAY IN OBSTETRICS

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During the last two years at Butterworth Hospital, radiograms were taken of 136 pregnant women at or near term, in which there was some reason to believe that disproportions or anomalies existed in either the foetus or maternal pelvis, which would likely cause difficult or impossible delivery through the birth canal. In 65 per cent of these cases, it was convincing that delivery could be accomplished safely. The remaining 35 per cent presented abnormalities necessitating very careful consideration to determine the method of delivery.

A study of the osteology and measurements of the normal female pelvis is essential in order to intelligently interpret X-ray pictures of the pregnant pelvis, and the pelvic anatomy should always be borne in mind in operative obstetrics. Measure-

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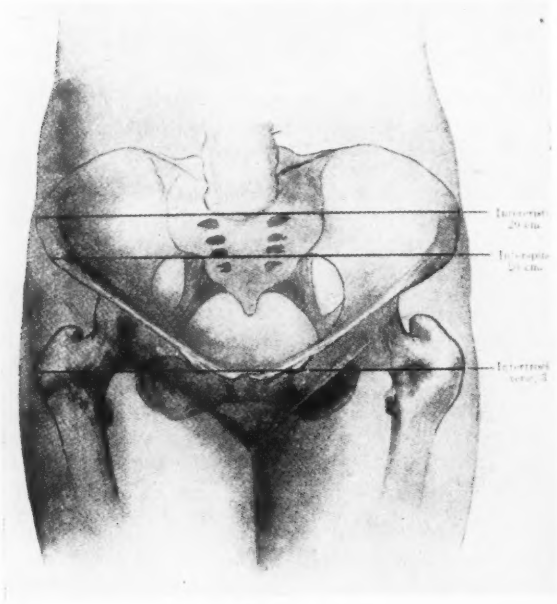

Figure 1
External Measurements.

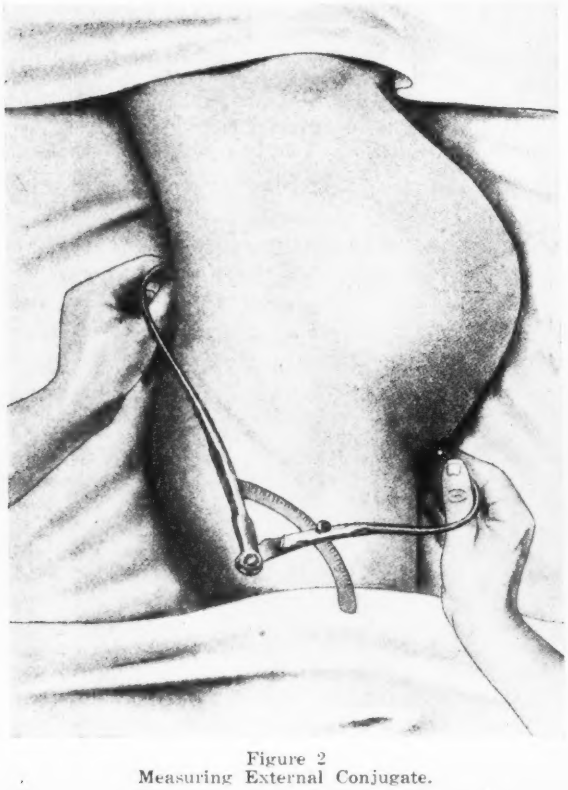

Figure 2
Measuring External Conjugate.

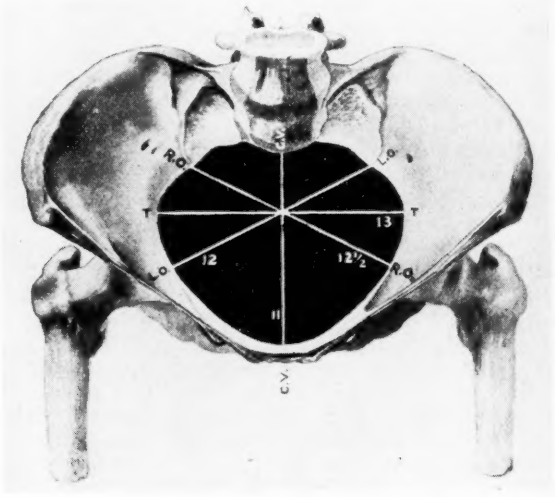

Figure 3
Pelvic Inlet.

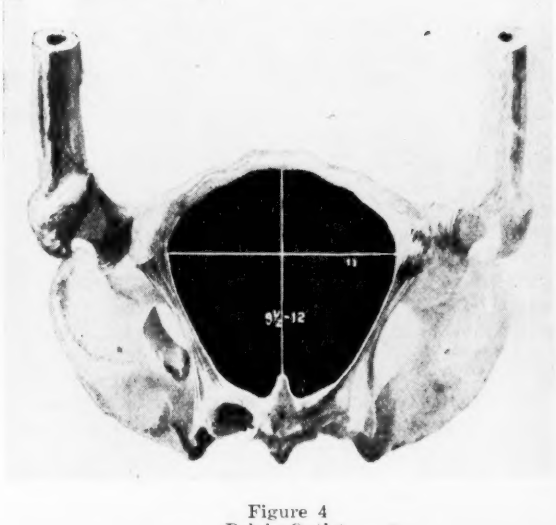

Figure 4
Pelvic Outlet.

ments of the pregnant pelvis, most frequently taken, are the interspinous, intercristal, bitrochanteric and external conjugate. They are only relative, but are of value in determining other absolute diameters of the pelvic inlet and outlet, impossible to obtain from the living subject.

Of all measurements, the most important and constant is the conjugata vera or true conjugate. This may be fairly accurately estimated by measuring with a pelvimeter the external conjugate or Baudelocque diameter and deducting 8 cm. Thus, an external conjugate of 18 cm. would have a true conjugate of 18 cm. less 8 cm. to equal 10 cm. Even though this method of Baudelocque is questioned by some, it nevertheless gives information, from which certain important conclusions may be drawn and is the most practical for all purposes.

CONTRACTED PELVIS

Several classifications of contracted pelves have been published. Michaelis classified beginning contracted pelves as those having a conjugata vera of 10 cm. or less in justominor types and 9½ cm. in those of the flat variety. Litzmann proposed four grades of contracted pelves according to the length of the true conjugate. The simple classification of Schroeder is perhaps the best, in which a conjugata vera of 10 cm. is made the lower limit of normal. Anything below this is considered a contracted pelvis. The shortest conjugata vera permitting the delivery of a normal sized child through the natural passages is 6½ cm., everything below this being considered absolutely contracted. If the conjugata vera is 6½ to 9 cm., the pelvis is considered relatively contracted. From 9 to 10 cm., difficult labors may be expected in all cases in which there is an error of mechanism rather than from disproportion of foetal head and pelvis. In all cases, much depends upon the size of the child, hardness and moldability of its head, presentation, position and attitude, all of which may make the pelvis smaller or larger, according to the spacial relationship between the foetal head and the pelvis.

Nearly all data collected on pelvic measurements varies and much is unreliable. A large percentage of obstructive labors occur in maternity departments of hospitals, where little, if any, study may be given to them until after delivery. It is generally recognized that the frankly contracted cases are best handled. In these, Caesarean section is usually resorted to and a living foetus obtained and an uncomplicated maternal recovery occurs. The border-line case is the one which causes the most concern. Abnormal presentations are frequently present in contracted pelves. When the head descends, it finds the entrance to the superior strait blocked, glides into one or the other iliac fossa, producing an obliquity of the foetal axis to that of the inlet, making it possible for the occurrence of partial or complete rotation of the foetal head. Subsequent contractions lock the foetus into an abnormal position. Soft foetal bones, as in prematurity and monstrosities, may prevent descent. Uterine contractions are also usually weak and there is early rupture of the membranes in contracted pelves.

CASE STUDIES

Of the 136 cases studied, 14 have been selected and are presented, with brief histories and radiograms to show the value of the X-ray in obstetrical cases.

Case 1—Mrs. H. S., File 13846. Normal pelvis. Para 1, age 30, term full. Position L. O. A. Measurements: I. S. 24½; I. C. 28; B. T. 30; E. C. 17½. Labor 25 hours.

Delivery—Low forceps; bi-lateral episiotomy; small vagina; narrow outlet. Baby alive; weight 7 lbs. 11 oz. Mother—Normal recovery.

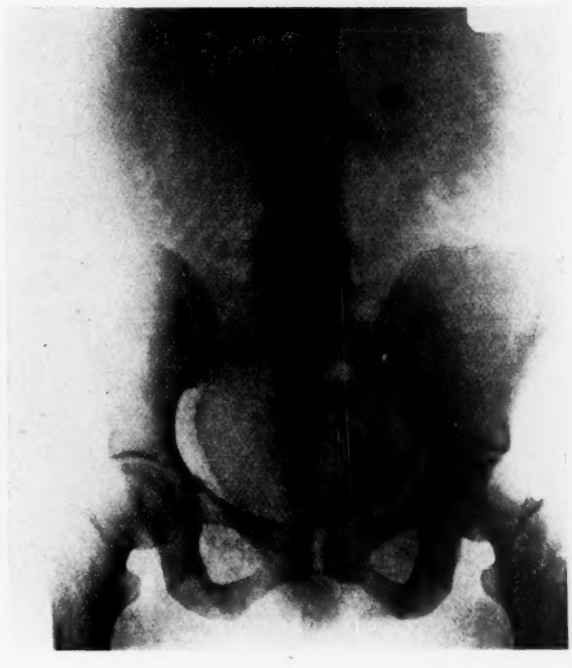

Figure 5

Antero-posterior view shows foetal head and pelvis relatively proportionate so that head will pass through without difficulty. Foetal spine is on left side of abdomen.

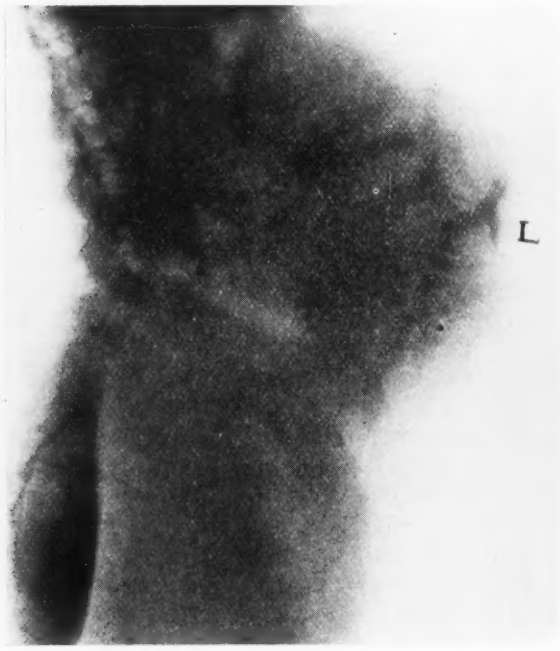

Figure 6

Lateral view with foetal spine anterior. Distance from sacral promontory to pubic bone is sufficient to permit descent of foetal head.

This case may be considered normal from an X-ray standpoint and should be borne in mind when comparing subsequent pictures.

Case 2—Mrs. E. B., File 15643. Large foetus. Para 1, age 29, term full. Position R. O. A. Measurements: I. S. 26; I. C. 29; B. T. 33; E. C. 21½. Labor 58 hours.

Delivery—Classical Caesarean section. Baby alive; weight 11 lbs. 6½ oz. Extensive molding of head. Mother—Normal recovery.

Figure 8

True conjugate not large enough to permit passage of head through birth canal. Normal delivery impossible. Caesarean section performed.

Case 3—Mrs. H. H., File 17143. Medium large foetus. Para 1, age 27, 10 days ante-term. Position L. O. A. Measurements: I. S. 22½; I. C. 25½; B. T. 34; E. C. 18½. Labor 36 hours.

Delivery—Mid forceps; episiotomy. Baby alive; weight 6 lbs. 10¼ oz. Cerebral compression, no hemorrhage, fair to good recovery. Mother—Normal recovery.

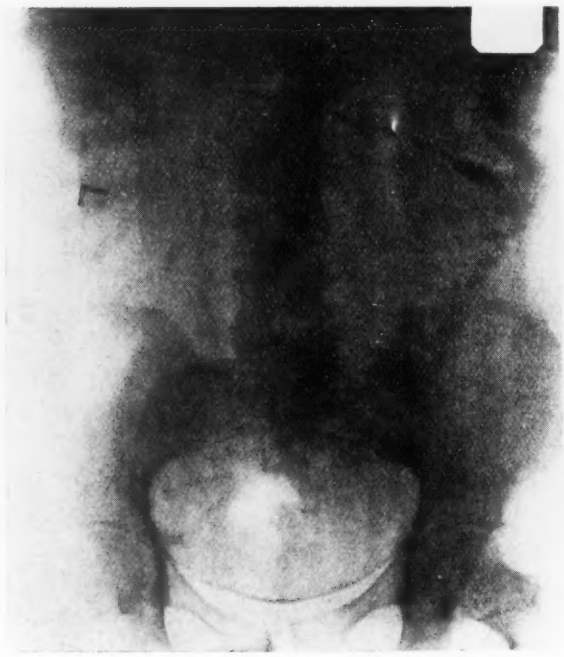

Figure 7

Extremely large foetal head and overriding bones. Disproportion of head and pelvis. Baby weighed 11 lbs. 6½ oz.

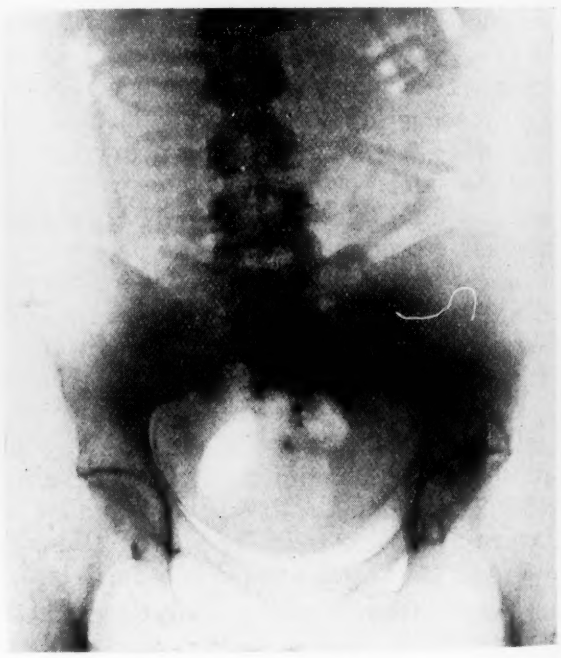

Figure 9

Border-line disproportion of foetal head and pelvis. Questionable whether head will successfully pass through pelvis.

Figure 10
Conjugata vera as compared with size of foetal head appears sufficient to permit normal passage.

History of this case is one of difficult labor and obstetrical manipulation, resulting in extreme cerebral compression of the foetal head and considerable trauma to mother. This patient is now pregnant and Caesarean section has been advised.

Case 4—Mrs. G. L., File 17248. Medium large foetus. Para 1, age 19, term full. Position L. O. A. Measurements: I. S. 22; I. C. 23½; B. T. 28; E. C. 17. Labor none.

Delivery—Caesarean section, abdominal muscles hard, tense with diastasis. Baby alive; weight 7 lbs. 1 oz. Mother recovered.

Figure 11
Medium large foetus. External cojugate 17 cm.; true conjugate 9 cm.

Figure 12
Head floating, in close contact with sacral promontory. Patient's abdomen large, fundus high. Caesarean section.

In all cases where the foetal head is floating and small parts are palpated high in the fundus, examine for disproportions and anomalies of the foetus and pelvis. This case is questionable for normal delivery and Caesarean section is indicated.

Case 5—Mrs. M. O., File 15346. Large foetus; long labor; manipulation. Para 1, age 22, 29 days post-term. Position between L. O. A. and L. O. P. Measurements: I. S. 22; I. C. 26; B. T. 33; E. C. 21. Labor 79 hours.

Delivery—Scanzoni; mid forceps. Baby alive; weight 8 lbs. 6¼ oz. Head showed marks of forceps. Mother good condition.

Figure 13
Large foetal head with extensive parietal overriding. From X-ray it appears progress would be normal, but it was not.

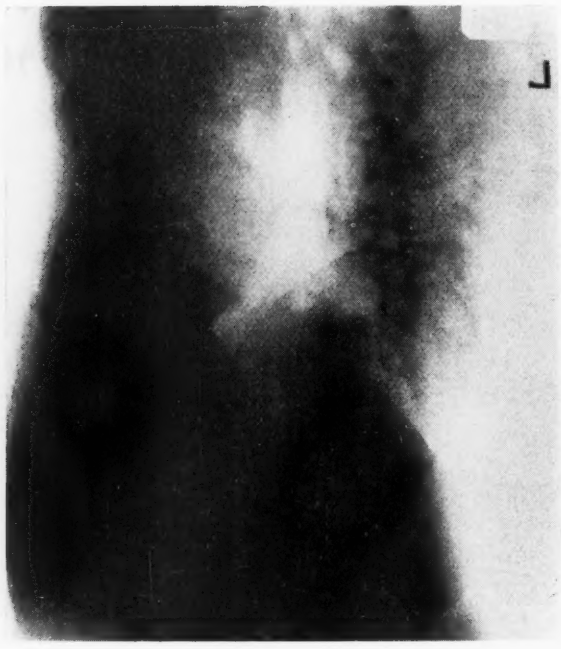

Figure 14
Forceps delivery gave live baby weighing 8 lbs. 6¼ oz. Extensive instrumentation.

Case 6—Mrs. C. A. B., File 14384. Butterfly spine; manipulation; complicated delivery. Para 1, age 25, 10 days post-term. Position L. O. A. Measurements: I. S. 24; I. C. 27; B. T. 31; E. C. 17. Labor 29 hours.

Delivery—Mid forceps. Baby alive; weight 9 lbs. 8½ oz. Brachial paralysis; cerebral hemorrhage. Died 18 hours after delivery. Mother—3rd degree lacerations.

Butterfly spine is an anomaly in which the transverse processes of the fifth lumbar vertebra articulate with the sacrum and wing of the pelvis.

Figure 15
No apparent disproportion. Labor was difficult. Study shows Butterfly spine.

Figure 16
Lateral view.

It occurs in about 2 per cent of cases. Patients with normal pelvic measurements and foetal position go into aparently normal labor, which is prolonged and difficult. X-ray study prior or subsequent to delivery may disclose a Butterfly spine, where other abnormalities are entirely absent.

Case 7—Mrs. M. K., File 15846. R. O. P. position. Para 4, age 34, term full. Position R. O. P. Measurements: I. S. 24; I. C. 27½; B. T. 31; E. C. 21. Labor 11 hours.

Delivery—Spontaneous. Baby alive; weight 8 lbs. Mother—Normal recovery.

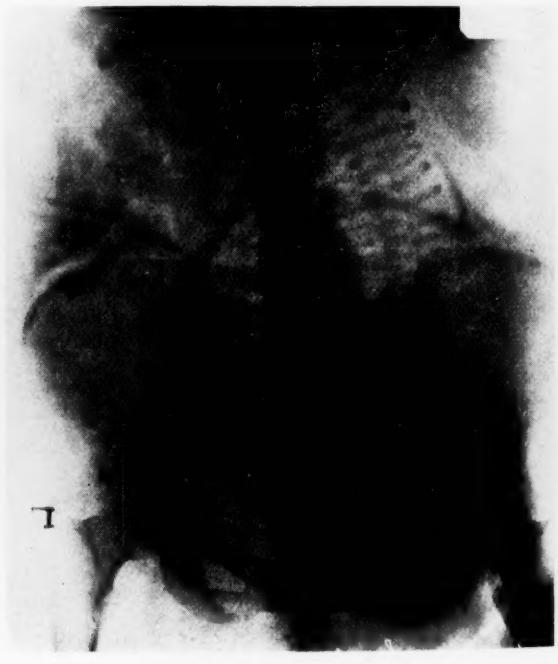

Figure 17
Value of X-ray demonstrated to diagnose position of foetus as well as disproportions and anomalies.

Figure 18
Foetal spine posterior.

Long labors in which rotation from posterior to anterior position do not readily occur, may be explained and anticipated in cases where diagnosis cannot be made with definite assurance by manual examination.

Case 8—Mrs. R. R., File 11331. R. O. P. position; Caesarean section. Para 1, age 28, term full. Position R. O. P. Measurements: I. S. 21; I. C. 25; B. T. 29; E. C. 17½. Labor 4 hours; no advancement.

Delivery—Caesarean section for contracted pelvis. Baby alive; weight 6 lbs. Mother—Uneventful recovery.

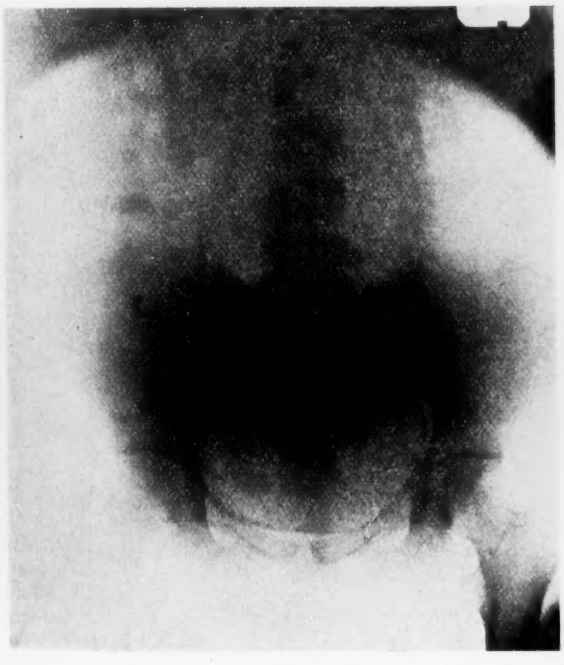

Figure 19
Spine of foetus on right side.

Figure 20
Foetal spine located, posteriorly. External conjugate 9½ cm.

In this case, the fact that the position was R. O. P. and that a small degree of contracted pelvis was present, Caesarean section seemed to be the procedure of choice.

Case 9—Mrs. R. E. E., File 16855. R. S. A. position. Para 1, age 25, term full. Position R. S. A. Measurements: I. S. 22½; I. C. 26½; B. T. 34; E. C. 19. Labor 15 hours.

Delivery—Spontaneous; episiotomy. Baby alive; weight 8 lbs. 3 oz. Mother recovered.

The X-ray is of material assistance in determining breech presentations.

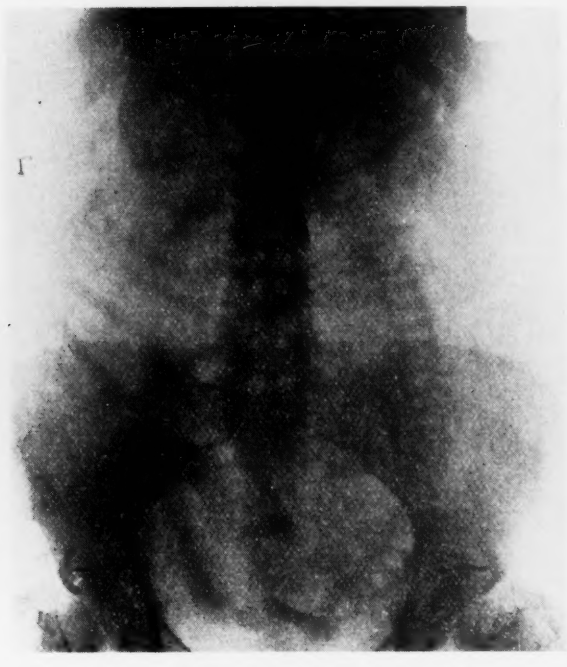

Figure 21
Sacral presentation.

Figure 22
Transverse position.

Figure 24
Monstrosity after delivery.

Case 10—Mrs. E. G., File 17115. Transverse position; previous operation for uterine suspension. Para 2, age 26, term full. Position transverse. Measurements: I. S. 26; I. C. 28½; B. T. 34; E. C. 20. Labor none.

Delivery—Classical Caesarean section. Baby alive; weight 8 lbs. 15¾ oz. Mother recovered.

Caesarean section was performed for the reason that the obstetrician did not believe he could successfully deliver the patient and obtain a living child by version.

Case 11—Mrs. S., File 14170. Monstrosity. Para 4, age 30, 24 days post-term. Large abdomen full of fluid. Position R. O. P. Measurements: I. S. 25½; I. C. 28½; B. T. 30; E. C. 20. Labor 14 hours.

Delivery—Version and extraction. Baby—Anencephalic monster. Mother—Normal recovery.

There is no greater disappointment to the expectant mother than to go through the period of pregnancy, be delivered with happy prospects and ultimately be informed that the baby is deformed. The X-ray clearly demonstrates the presence of monstrosities before delivery.

Case 12—Mrs. J. B., File 15499. Monstrosity. Para 1, age 33, term full. Position R. O .A.

Figure 23
Monstrosity before delivery.

Figure 25
Large monstrosity before delivery.

Figure 26
Monstrosity after delivery.

Measurements: I. S. 27; I. C. 30; B. T. 32; E. C. 22½. Labor—Membranes ruptured 7 days ago. Amniotic fluid, 4 plus. No pains for 50 hours. Castor oil and quinine with negative results.

Delivery—Voorhees' bag; version and extraction. Baby—Monster. Mother recovered.

Case 13—Mrs. A. C. S., File 1826. Deformed spine. Para 1, age 23, 21 days post-term. Position L. O. A. Measurements: I. S. 21; I. C. 24½; B. T. 31¾; E. C. 18¾. Labor induced by castor oil and quinine; duration 4½ hours.

Delivery normal. Baby alive; weight 6¾ lbs. Mother recovered.

(Unfortunately the X-ray of this case showing the pregnancy was destroyed and subsequent radiograms were taken after delivery).

Figure 27
Lateral spinal curvature.

Figure 28
Lateral view.

This patient was one in which complicated delivery was expected on account of the spinal deformity. Normal labor has subsequently occurred upon two occasions.

Case 14—Mrs. F. Y., File 11648. Pituitrin; axis traction forceps; dead foetus. Para 1, age 27, term full. Position R. O. P. Measurements: I. S. 22; I. C. 26; B. T. 30; E. C. 18½. Labor 25 hours.

Delivery—Axis traction forceps; episiotomy; 3rd degree laceration. Baby dead; cerebral compression. Weight 6 lbs. 12 oz. Mother—Complicated recovery.

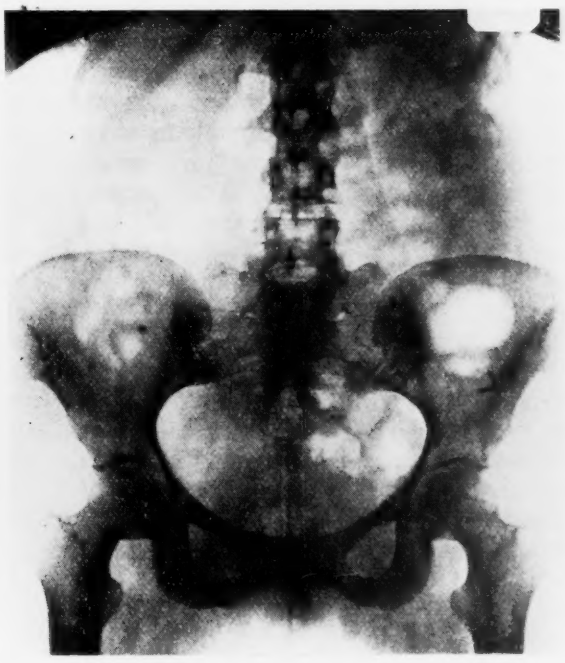

Figure 29
Antero-posterior view of apparently normal pelvis. Complicated forceps operation was resorted to with disastrous results.

Figure 30
Lateral view, after delivery.

This is a case in which poor judgement was used in the choice of obstetrical procedure. During labor, which lasted 25 hours, pituitrin and axis traction forceps were used indiscriminately and the patient was delivered with extensive lacerations, great loss of blood and shock. A subsequent labor of recent date resulted normally.

DISCUSSION

In the cases presented, it is to be understood that no claim is made that the radiogram is infallible in guiding the obstetrician to select a proper method of delivery. Other findings such as age, parity, physical condition, development of soft parts of the mother, foetal position and pelvic measurements are very important. The X-ray serves only as an adjunct, especially in the cases of primiparae. There is no organ in the body which does not present at some time an abnormality and it is as frequently found in the bony formation of the pelvis and development of the foetus as elsewhere. It is the opinion of obstetricians that a radiogram should be obtained in every case of pregnancy in primiparae where the slightest suspicion of a disproportion or an anomaly is present and also in multiparae with histories of previous difficult deliveries.

X-RAY TECHNIC

Criticism may be made that the position of the patient on the table, the degree of rotation of the foetal head, the angle and distance of the X-ray tube from the pelvis, may lead to inaccuracies in the interpretation of the relative proportion of the pelvis and foetal head. A method is being worked out by Dr. G. G. Stonehouse, roentgenologist at Butterworth hospital, and myself, whereby the pregnant pelvis may be X-rayed and more definite information obtained as to pelvic measurements.

By this technic, one film is first taken in the antero-posterior plane. The developed film thus gives the foetal position. A lateral view is next taken ,with the patient lying on the same side in which the foetal back is located. A pelvimeter (with lock nut) is next applied in the position to measure the external conjugate, carefully placing the two ends in the same horizontal plane. The caliper ends are fixed in position with adhesive tape at the pubic and lumbo-sacral extremities, before the picture is taken. On the films it is possible to measure the apparent internal conjugate, between the foremost point of the sacral promontory and the internal superior margin of the pubic bone; the external conjugate, between the shadow of the caliper ends of the pelvimeter. The known factor of the external conjugate, as previously taken with the pelvimeter, is used in an equation with the above findings to determine the true or internal conjugate.

It has been proven geometrically, that parallel lines cut by lines radiating from a point are divided into proportionate segments.

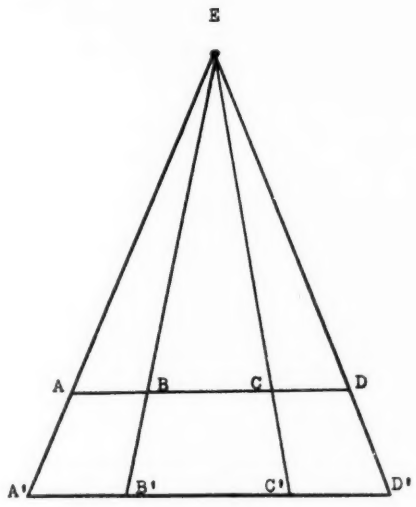

Figure 31
E represents X-ray tube.
A B C D represent pelvis.
A′ B′ C′ D′ represent X-ray plate.
AD equals external conjugate.
BC equals internal conjugate.
A′D′ equals external conjugate X-ray.
B′C′ equals internal conjugate X-ray.

From this the following equation has been deducted:

$$\frac{\text{Ext. Conj. X-ray}}{\text{Ext. Conj.}} \;\therefore\; \frac{\text{Int. Conj. X-ray}}{\text{X}}$$

Example: (Measured in mm. for convenience).
1. External conjugate previously taken equals 200 mm.
2. External conjugate by X-ray film equals 300 mm.
3. Internal conjugate by X-ray film equals 150 mm.
4. X equals true internal conjugate.

$$\frac{300}{200} \;\therefore\; \frac{150}{X}$$

300X equals 30,000
3X equals 300
X equals 100 mm. or 10 cm., true conjugate.

All films are taken with a Bucky Diaphragm at 25 inches distance from the pregnant abdomen. It has been found that by careful technic, there is very little error in the results obtained.

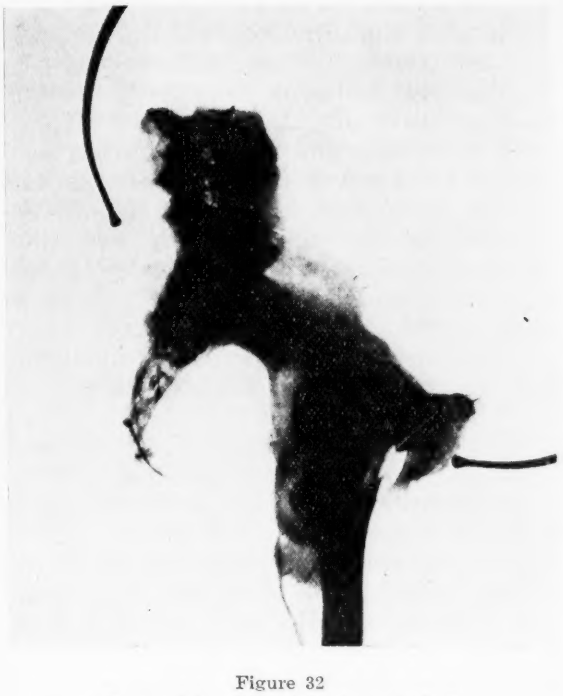

Figure 32
Bony pelvis with pelvimeter attached.

This method has been quite definitely proven by making a check study of a number of surgical cases, upon which pelvic and abdominal operations were performed, permitting such study. All external pelvic measurements and X-rays were carefully taken prior to operation. The true conjugate was then determined by estimation from the external conjugate and also by X-ray film measurements. At operation, an obstetrician, trained in pelvimetry,

Figure 33
Pregnant pelvis with pelvimeter attached and measurements marked.

measured the internal conjugate with a DeLee internal pelvimeter. By thus obtaining the true or internal conjugate, it is possible to check the reading of the X-ray film. The series of cases studied has not yet been completed, but will be reported later.

It is also planned to study a technic whereby the biparietal, antero-posterior and suboccipito-bregmatic diameters of the foetal head may be determined antepartum.

This report is only preliminary. Further studies are being made on more cases. The following summary proves that the use of the roentgen ray in examination of pregnancy cases at term is valuable:

1. As an adjunct to other methods of obstetrical examination.
2. To definitely ascertain foetal and pelvic disproportion.
3. To accurately diagnose foetal position and extent of epiphyseal formation.
4. To show the contra-indications for the indiscriminate use of pituitrin and forceps.
5. To assist in the choice of delivery technic in subsequent pregnancies.
6. To avoid disappointment to the mother and embarrassment to the physician in the delivery of a still-birth or monstrosity.

TREATMENT OF ACUTE EMPYEMA COMPLICATED WITH BRONCHIAL FISTUAL

According to Ralph B. Bettman and Nathan N. Crohn, Chicago, a bronchial fistula that occurs in actual pleural empyema almost invaribly closes after artificial drainage has been established. Allowance can be made for the escape of pus and air from the pleural cavity and yet the consequences resulting from an artificial open pneumothorax can be prevented. The closed method of drainage is just as desirable in cases complicated with bronchial fistula as in the uncomplicated cases of acute empyema.—Journal American Medical Association.

THE USE OF WINE IN ROMAN MEDICINE ACCORDING TO CELSUS

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It is as difficult to trace to its beginnings the making of wine as it is to find primitive man. In other words, the use of wine is found in all literatures and in them back to their earliest sources. Whether you read comedy, tragedy, epic, history, didactic poetry, lyric poetry, medicine or law,—whether it is religious or secular literature, you will find the word "wine." Songs of love, toasts, feasts, and ditties poets love to write have in them references to wine, that juice of the vine the use of which has at times been extolled, at times forbidden.

The cultivation of the vine for the manufacture of wine antedates Sanskrit literature, since in it there is no indication that wine was in any way a new product.

Hebrew literature offers one of the earliest examples of its use when Noah, to his chagrin, found the potency of his product, for the statement reads: "And Noah began to be an husbandman, and he planted a vineyard; and he drank of the wine and was drunken; and he was uncovered within his tent." Other references are familiar both in the New Testament as well as in the Old Testament where wine was used for a drink offering or for sacrificial purposes. A generous collection of references could be made of forbidden and approved usages of wine. Everyone has heard at least a portion of the injunction which has become proverbial: "Drink no longer water, but use a little wine for thy stomach's sake and thine often infirmities."

To read of Bacchus and the feasts of the vintage, an erroneous notion is sometimes gained that wine was associated only with hilarity, while back of all this was the more fundamental idea that wine was a part of the diet, for it was supposed to bring sustenance and to have healing properties.

Wine was not a new product to the people of the Homeric times, and it was frequently mentioned with food as a part of the diet. One example of this is: "All of you comfort yourselves with food and wine for in these are vigor and courage."

From the Homeric poems, on down through Greek and Roman writings, it will be found that wine has ever played an important role in religious rites, at feasts, and in dietetics. In this paper we are interested in that phase last mentioned.

It is difficult to know how far the rank and file of the Romans paid any attention to the things they ate and drank with reference to their well-being, and the only positive method we have of learning what had been done and was still practiced in dietary measures is to refer to the statements of medical writers.

It is true that the Romans did not advance the science of medicine to any extent, yet what had been done by the Greeks was kept alive on Italic soil by Greek slaves, freedmen, and the few Romans who engaged in this business—for it was not as yet a profession to the Roman. If we are to accept the view of Pliny that the Romans had done without physicians for many years and had got on very well, it shows us that the Romans were neither ready to accept the practice of medicine whole-heartedly nor to put its practice on a high level.

Aulus Cornelius Celsus wrote an encyclopedic work early in the first half of the first century of the Christian Era, and this work treated of philosophy, jurisprudence, warfare, and medicine. Of these writings entitled *De Artibus*, only eight books (Books VI-XIV of the complete work) have survived, which are known as *De Medicina*. We do not need here to go into the controversy whether or not he was a physician, except to state that some hold he was a physician because he wrote so intimately of medicine, at times expressing opinions in the first person; others believe he was not a physician, but a compiler, else he could not have written on so many subjects.

The work of Celsus is the only Latin writing on medical procedure which is a sane exposition of its history and practice. Pliny's *Natural History* has some interesting statements, but there is bound up with his story too much of the folklore and statements utterly absurd to call it a strictly medical work.

Wines were manufactured and exported from many districts; thus some of them received the names of the districts where

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they were made. A list of these, together with the various kinds of wine and the authors mentioning them, may be found in Daremberg and Saglio, *Dictionnaire des antiquites grecques et romaines.*

Celsus employs many adjectives to characterize the wines he refers to, and seldom does he mention special brands, confining these to Greek salt wine, Aminaeum, Rheticum, Allobrogicum, and Signinum. He usually refers to wines as cold, warm, sour, old, dilute, unmixed, mild, etc. His artificial wines are *mulsum* (honey-wine), *passum* (raisin wine), *defrutum* (must boiled down), Greek salt wine, and *resinatum* (wine flavored with resin).

Celsus, mentioning various drinks, says that the most nourishing are those made of grain, likewise milk, *mulsum, defrutum, passum,* either sweet or strong wine. Those which can be placed in the middle class are vinegar, wine which is a few years old, and sour or light wines. Water is the weakest of all. The stronger the grain, the stronger the drink made therefrom. Stronger is the wine from materials grown on good soil than on poor soil; that from a temperate climate is stronger than that from either too dry or too hot; the weakest from either cold or hot climate. *Passum* is from dried grapes; *defrutum* is slightly cooked; *mulsum* is stronger, having more honey. Rain water is the lightest, then come spring water, river water, well water, and after these, water from snow and ice; more indigestible than these is water from lakes, and worst of all is water taken from swamps.

Dealing with wine in its broad sense of no particular kind or quality, but as a generic term, let us look at some of the passages where Celsus uses this word (*vinum*). These references do not admit of dogmatic classification, nevertheless it is clear that wine was considered as a part of the diet, as an internal medicine, and it was used also in external applications and in medical compounds.

WINE AS AN ARTICLE OF DIET

Since wine, as it has been pointed out, played an important part in the diet among the ancients, and for this reason it was classed as food, let us bring together some statements from medical thought gathered by Celsus in which he deals with wine as an article of diet. Space does not permit our going thoroughly or completely into these passages, but enough will be given to show the emphasis that was placed on this use of wine.

In the introduction to the *De Medicina,* Celsus, referring to the Empirics, states that a physician will seek new methods in order to bring about a cure, not from hidden conditions, for these are doubtful and uncertain, but from those which are able to be investigated; that is, from apparent causes. Therefore, it is important to note whether fatigue, thirst, cold, heat, restlessness, or hunger causes disease, or whether it is due to excess in the use of food and wine. Diet, then, according to the Empirics, was an important factor in determining the cause of disease.

We have the notion that we are giving more attention to diet today than ever before, and certainly from a scientific point of view this is true, yet regulations for and against the use of food and drink are stamped on every page in Celsus. The methods for "reducing"—which is today so widely advertised and practiced—were not overlooked by our predecessors, and you may compare the modern efforts with these suggestions: bathing in warm water, especially salt water; hot sun; worry; insomnia; too little or too long sleep; a hard bed; running; much walking; all violent exercise; vomiting; purging; acid foods taken once a day; a drink of not very cold wine in addition to the customary amount.

Celsus notes the effects various foods have on the body. Those which tend to produce warmth are pepper, salt, meat juices, dried figs, and wine especially when unmixed. This wine, of course, would have more alcoholic content than the mixed. Elsewhere it is stated that heat is produced by anointing, by using salt water more so if warm, by eating meats, and by taking sour wine after meals.

Among the foods which are least easily broken up in the stomach are leaven bread, milk, honey, pastries, tender fish, oysters, fresh and old cheese, sweet wine, honey-wine, boiled must, and raisin wine. The following foods cause the least trouble in the stomach: unleaven bread, all hard meats, all salted things, sour wine or resin wine. It will be noticed that sour wine is frequently mentioned as the wine most beneficial.

As laxative foods a number of vegetables are mentioned, also apples, dried figs, pure honey, honey-wine, sweet and salt wines, and soft water. The use of salt wines compares with our saline drinks of today in medicinal value. Some of the non-laxatives are certain meats; cheese which becomes strong with age; resin, bitter, or unmixed wines; vinegar; honey-wine

which foments; boiled must; raisin wine; tepid or very cold water.

The inflating articles are nearly all vegetables, rich and sweet things, unfermented wine and wine that has not yet aged. Least inflating are fish, apples, olives, and old wine. A long list of edibles suitable to the stomach is given, among which are sour wine, although it may be bitter, and resin wine.

The general practice of forced vomiting among the Romans is well known. Celsus warns those who would be strong and live a long life to refrain from making this a daily practice and adds that wine is a good thing to settle the stomach after so doing.

FEVERS RECOGNIZED EARLY

The physicians of ancient times gave much attention to fevers and they were acquainted with their characteristics, especially their duration. Wine is often mentioned in connection with their treatment. Lingering fevers do not admit of treatment by diet or any remedy. It is for the physician to change the disease, as Celsus puts it. If there are chill, listlessness, and a tossing of the patient, it may be beneficial to give about one-third of a pint of honey-wine or wine well diluted when food is taken. In connection with this type of fever Celsus relates a treatment given by a certain Petro who, when he found a man with fever, covered him with clothing that he might produce great heat and thirst. Then, when the patient began to recover slightly from the fever, he gave him a drink of cold water, and if this caused a sweat, he judged that he had relieved the sick man. But if this method did not produce sweating, he furnished him with more cold water and then forced him to vomit. If he freed him from the fever by either method, he at once gave him roast of pork and wine.

Several remedies are suggested to relieve chills in connection with fever. First, the food must be especially of that type which will aid a weak stomach, and the wine should be sour, if given. In case of contagious fevers it is least useful to employ hunger, medicine, or purgatives. Here rather earlier than in other diseases use the bath and offer warm, unmixed wine. With fever cases generally the Methodists (followers of an ancient school of medicine) inquire whether the body is bound or flows. In case of the former, liquids ought to be given freely both before and after meals, and with them, even more than thirst requires. Rather rich or somewhat sweet wine can be given after the bath, and Greek salt wine can be given once or twice in between. In the latter, when it comes to food, it ought to be strengthening, cold, dry, simple—that which is least able to cause distress, as toast bread, roast meat, and sour wine or certainly slightly sour. If the stomach flows, use warm wine; if sweats annoy or there are vomitings, use cold wine.

When Celsus treats of the fevers which have fixed courses, he has set regulations for each day. In the daily fever (*quotidiana febris*) one ought for the most part to abstain for the first three days, then use food on the alternate days. If this condition becomes long-standing, it is beneficial to try bathing and wine after the fever, more so if this fever remains when the chill has passed.

Tertian fever (*tertiana febris*). One of the ancient physicians, Cleophantus, dealing with this type of fever, used to pour much cold water over the head of the patient and gave him wine long before the attack.

Although Asclepiades followed many of the principles of this man, however, he quite properly passed this by as its results were doubtful. Asclepiades, if the fever was tertian, had the stomach purged on the third day after the attack, induced vomiting on the fifth day after the chill, then after the fever, as was his custom, he offered food and wine, although the patient was yet feverish. He kept the patient in bed on the sixth day, and so it happened that the fever did not return on the seventh. However, it is safer to use this method, namely three remedies: vomiting, purging, and wine for three days, that is, to try it on the third, fifth, and seventh days. If weakness continues, take wine after the fever and a little food at midday. Apparently, the wine here was used as a stimulant.

After the quartan fever (*quartana febris*) has moderated, some food may be given together with a measure of wine, and on the second and third days the patient should abstain, taking only warm water if there is thirst. On the return of the fever, repeat the treatment. On the tenth day try the bath and if fever comes thereafter, employ rubbing and drink copiously of wine. Heraclides of Tarentum advises rubbing, anointing, partaking of nourishing food, and using wine after the fever, and on the following day walking, exercising, and taking food and wine; again abstaining on the third day. In

sickness of this kind the remedies are oil, rubbing, exercise, food, and wine.

A *duae quartanae* fever is mentioned. After the fever comes and goes, take a moderate amount of food and wine; for other times abstain entirely unless weakness persists. In general, then, we see that food and wine were not usually given while the fever was on, but as soon as it subsided nourishment was given to keep up the strength.

The bath has a twofold usage, for sometimes when the fever has been broken up it paves a way to a more general diet and the use of stronger wine for the patient; sometimes it takes away the fever itself.

There is scarcely a disease treated by Celsus that is without some mention of wine. Very briefly I shall mention some of these diseases and state how wine figures in the diet. In drowsiness it is stated that wine given with suitable food aids greatly. In dropsy where fluid is in the abdomen, food is unnecessary on that day when first the humor is expelled unless the strength fails; on the following days both food and unmixed wine may be given, but not too much.

In the various phases of phthisis there is a tendency to the avoidance of wine. For some days drink water, then drink cold water if there is no cough, but if there is, drink luke warm wine. No doubt, the warm wine was prescribed to avoid any shock or nervous reaction to the throat.

With headache avoid the heat of the sun, especially after food and wine. If one has trouble with the oesophagus, he ought to read aloud and walk after reading; then play at ball or arms, or take some exercise to move the upper part of the body. When thirsty, do not drink water, but warm wine, and take food twice a day. Use mild and sour wines.

In case of slow digestion it is wise to read aloud, then to walk, be anointed and bathed. Drink always of cold wine and after food a larger potion, but, as was mentioned before, through a siphon; later to conclude all drinks with cold water.

If an ulcer infest the stomach, about the same things ought to be done as prescribed for the throat: rubbing of the lower parts, light foods, but do not eat to satiety, and take away all things bitter and acid. In addition Celsus says one may use sweet wine if there is no fever, and if there is inflation, certainly use mild wine, but neither very cold nor too warm. More troublesome is it if the stomach is defective in bile, when the diet should comprise of food easy for the stomach and sour wine. One of the worst faults of the stomach is when it will not retain the food and thereby the body fails to get proper nourishment. Cold wine is very suitable, and very warm, unmixed wine is helpful. Efficacious is Rheticum, Allobrogicum, or other sour wine preserved with resin; if not, these take very bitter wine, especially Signinum.

If there is internal bleeding or bleeding from the mouth, great care must be taken, and if there is no fever the drink may be of sweet wine or cold water. Generally, wine, bath and all things acid are injurious. When, in case of pleurisy the cough has let up, one may take acid foods and unmixed wine.

One method of curing diarrhoea is to eat, then to vomit, to be gently anointed at evening, then on the following day to remain quiet in bed and take about a half a portion of bread with Aminaeum wine and some boiled meat, and then drink wine mixed with rain water. It sometimes happens that, when this disease is neglected for some days, it is more difficult to cure. Vomiting should be employed, on the following day taking a moderate amount of food and unmixed wine as bitter as possible.

There is an ulcer which the Greeks call *phagedaina*, which spreads quickly and penetrates to the bone and eats the body. If after certain treatments the inflammation subsides, the patient may drink as much as he wishes, but he must be content with water. However, at dinner he may have a little sour wine.

When ulcers appear on the tonsils there is need of light food, to which sweet wine may be added. Pure wine and rather more food, providing it is free from acids, are helpful in case of ulcers of the mouth. There is an ulcer which comes from the gums and spreads throughout the mouth, and this is very dangerous in case of children. In this case the nurse of the child must care for her health, drinking water if the child is feverish and dilute wine if he is without fever.

There is a certain fault of the eye called *morbus pedicularis* and this arises within the hairs of the eyelids. It is best to avoid strong foods and to use milk or rich wine. One should drink more than he should eat.

Celsus describes what we now call a cold. Phlegm flows from the head sometimes into the nostrils, sometimes into the throat, which is worse, and sometimes into the lungs, which is worst of all. The nos-

trils are closed, the voice is thick, there is a dry cough, and the ears ring. This trouble is of short duration, but if neglected it is accustomed to stretch out for a long time. There is not much danger unless it ulcerates the lungs. When we feel something of this kind, we ought to abstain from the heat of the sun, bath, and wine, nevertheless we ought to use customary food. If this abates within a few days, then we may drink wine with a full diet, but if this condition persists sour, Aminaeum wine ought to be taken, then water for two days, after which return to the bath and regular habits.

WINE AS A REMEDY

Celsus describes the use of wine as a medication, that is, with medicinal value, and under this caption I shall include a few prescriptions in which wine is found as an ingredient, not for the purpose of identifying various drugs or analyzing the compounds themselves, but in order to show that wine was frequently employed in Celsus' pharmacopedia. It is quite probable in these compounds that the wine was added for the purpose of dissolving or preserving other elements of the prescription.

If blood flows from the mouth, hold unmixed wine therein; if this is of little effect, use vinegar. The stomach may be cleared by giving cold milk, salt wine, and if the time of year permits, green figs. If a daily fever comes to be long-standing, try bathing and wine after the fever has subsided, more so if the fever remains after the chill has passed. After a formula has been prescribed in case of dropsy, Celsus notes that sour wine is also useful, but it should be taken as weak as possible.

Sacer ignis is the term for herpes zoster, or shingles, as it is commonly known. This ought to be numbered with the disagreeable ulcers, and if one is afflicted with this disease, providing there is no fever, walking, sour wine, and the bath are helpful. In case of severe stomach pains where other remedies fail, a glass of wine every other hour should be taken until the stomach settles.

Dysentery, he says, is an ulceration of the intestines, and in the first place it is necessary for the patient to be quiet, then, if moving about makes the condition worse, he may be given a measure of wine to which powdered cinquefoil is added. Again, if there is little fever, pure, warm water or those things which are of themselves astringents ought to be given; if there is no fever, offer a light, sour wine.

The ancients knew of poisonous concoctions, and, as we know from many historical allusions, poison was the fashionable, frequent, and effective method of doing away with a public or private enemy. It was necessary to have antidotes to counteract the effects of these drugs of which the Romans had a great store. Celsus devotes a number of pages to antidotes.

It is not easy to aid those who have taken poison, first because they do not at once feel the effect of the poison, just as in case of a snake's bite, so they are not able to aid themselves; more than this, the injury does not begin on the skin, but from within. It is very beneficial as soon as one perceives he has been poisoned that he induce vomiting by drinking a great quantity of oil, then when he has emptied the stomach he should take an antidote, and if this is not done, take unmixed wine. This calls to our mind the stories of the frontier days when whisky in great quantities was given to those who had been bitten by rattlesnakes. There are, however, remedies against certain poisons, especially the lighter ones. If one has drunk Spanish fly (*cantharys*) he ought to be given allheal (*panaces*) crushed in milk, galganum with wine, or milk by itself.

If hemlock is taken, much warm wine should be offered with rue (*ruta*), then the patient should be forced to vomit, and afterwards give asafoetida with wine. If there is poisoning due to white lead (*cerussa*), the juice of mallows (*malvae*) or powdered rush (*iugulans*) with wine is especially beneficial.

As a general rule antidotes are rarely necessary, nevertheless they are needed sometimes because they aid in severe cases. They are properly administered when the body suffers collision from a blow, or when one falls from a height, or when there is pain in the sides, throat, or internal organs. However, they are given particularly against poisons either from bites or from food and drink which have entered our bodies.

Many of these prescriptions are known by special names which are quite the same as trade names. One of these is that which Zopyrus is said to have made for King Ptolemy and is called *Ambrosia*. After stating the elements which go to make up this complicated prescription, the dosage is a quantity the size of an Egyptian bean dissolved in a drink of wine.

The most celebrated is mithridate by the taking of which daily King Mithridates

is said to have rendered his body immune against the dangers of poisons. Of this compound, that which is the size of a *nux Graeca* (almond) should be given in wine.

The scorpion is an excellent medication against its own bite. Some drink it pulverized in wine. Indeed, some in the same way place it on the wound. However, one ought to drink the seed of the herb heliotropium (*solaris*) or certainly its leaves in wine.

Catapotia, or pills, are many in number and are used for various purposes, but their use is dangerous unless there is great need of them, for they are made of exceedingly strong medicines which are foreign to the stomach. One of these which is harmful is composed of mandrake, parsley (*apium semen*), henbane (*hyoscyamus*) placed in wine. There are many references where medicine is to be taken with wine.

Snakes from foreign places are more pestiferous, especially those which thrive in warm places. Italy and colder regions, where the climate is more salubrious, have less terrible snakes. Against their sting betony (*vettonica*), *cantabrica*, or centaury (*centaurium*), elephant's head (*trixago*), *personata* (burdocks) or sea parsnip (*marina pastinaca*) once or twice beaten and given with a drink of wine and placed on the wound is beneficial.

Celsus' treatment of the eye has been considered one of the best portions of the *De Medicina*. A very old authority, Hippocrates, according to Celsus, says that the eyes may be cured by the drawing of blood, by medication, and by wine. After various treatments against inflammation of the eye, Celsus adds: Drink mild, slightly sour, moderately old wine. If anyone perceives a greater distress in the eyes during the bath, he ought to take no wine on that day and even less food than the day before.

Euelpides, who according to Celsus was the most famous *ocularius medicus* of his day, has several prescriptions, one of which is mixed with sour wine, another with Aminaeum wine. Honey and wine relieve scabby conditions in the corners of the eye. This kind of eye trouble and bleariness are benefited if one places on the eyes bread soaked in wine.

There is more danger in treating the ears, for inflammation and pains of the ear sometimes cause dementia and death As soon as one feels pain in the ears, he should abstain from food. A treatment for ulcerated ears where the condition has become chronic, is given on the authority of Erasistratus as follows: pepper, cucumber, myrrh, copper ore (*misy*), copper scales (*aes combustum*). These ingredients are mixed with wine, then when they become dry add three measures of raisin wine (*passum*), and when this is used add honey and wine.

The prescription of Crato employs cinnamon, *lycium* (a kind of thorn), spikenard (*nardum*), myrrh, honey, wine of which the *lycium* is cooked in wine, then they are mixed.

If there is a discharge from the ears and there is a swelling, it is helpful to wash the ear with a syringe using mixed wine, then to pour into the ear sour wine to which a little tutty (*spodium*) is added.

When there are worms in the ear, if they are not far in, they can be drawn out by an instrument made for the purpose; if they are far within, they must be killed by medication, and care must be taken that they do not thereafter return. It is necessary to wash the ear with wine in which horehound (*marrubium*) is boiled down. The worms, dying in the first part of the ear, can easily be drawn out.

If there are adhesions in the ear and thick matter settles therein, it is best to use honey and sufficient wine to dilute the myrrh.

In one of the passages dealing with teeth there is this statement: That portion of a tooth which has become black or rough must be smoothed off and smeared with crushed rose leaves to which a fourth part of galls and another of myrrh are added. Also one must frequently hold unmixed wine in the mouth. We wonder what success a dentist would have today who instructed his patient to hold wine in his mouth!

One of the interesting practices of using wine as medicine—no doubt as a stimulant—is the drinking of water and wine on alternate days. According to Celsus, it is better for one suffering from headache to drink continually more of dilute, light wine than of water, so that when his head begins to be rather heavy, there may be something to which he may turn, for usually neither wine nor water is always helpful. Both are medicines when taken in turn.

Celsus gives some hints for those who are well, but who have been exposed, and suggests methods by which they may avoid diseases. In addition to several suggestions he says that one ought not to change his method of living. Not only should

these things be done in every pestilence, but also especially against those ills which the south wind arouses. The same precautions are necessary for travelers when they depart from their homes at an unseasonable time of year, or when they go into unhealthy regions. If anything prohibits one from following these precautions, one ought to abstain from food, and he ought to go from wine to water and from water to wine.

After Celsus has treated of conditions which exhibit certain indications of coming ill health, he sets forth treatments which should be undertaken. If any of these symptoms appear, quietness and abstinance are best of all. If one must drink something, it should be water. Sometimes these precautions are sufficient for one day, at other times for two days if the symptoms are alarming. After abstinance, a little food and water should be taken, then in turn on alternate days take wine and water until all cause of fear is ended.

In certain phases of dropsy it is necessary to subject those parts which swell to the sun. Food should be of the type which is strengthening, and wine, if the stomach can take it, should be rather sweet, but for a period of two or three days in between water should be taken.

Convalescents ought often to change their place of residence, climate, and food. When they drink wine for three or four days, water ought to be taken for one or two days in between. In case of continued fatigue one ought to drink in turn wine and water and seldom use the bath. A patient suffering from tenesmus should not count this with serious nor prolonged diseases. On alternate days one ought to drink first water, then a mild and sour wine.

WHEN WINE IS TO BE AVOIDED

Although Celsus prescribes the use of wine under certain conditions, it is important to notice there are times when the use of wine should be restricted or forbidden altogether. In the few references selected to show that medical practice did forbid the consumption of wine, we must conclude that, whatever healthful properties it possessed, it was not considered a panacea for all ills and at times considered positively harmful to indulge.

Those of middle age most easily endure fasting, young men less easily, and boys and those wasted with age, the least. He who endures abstinence less easily ought to take food more often, and especially is he who is growing in need of food. Rather dilute wine is better for boys and unmixed for the old; neither should take wine if it causes inflation. Generally speaking, boys ought not to be cured as men, therefore as in other types of diseases, one should use the following treatments rather sparingly: cure by letting blood, by purging, by hunger, by thirst, or by wine.

If there are slight indications of disease, it is sufficient to abstain from wine, and this abstinence from wine aids more than if food is withheld. If the symptoms are slightly more pronounced, one ought to drink less of water and even remove meat from the diet. Sometimes it is better to eat less bread than customary and to be content with soft food and oil. When somewhat violent symptoms are alarming, one should abstain altogether from food, wine, and every movement of the body.

A chill usually precedes those fevers which have a fixed course, after which they generally let up, so they are least dangerous and admit of cures. For when these fevers are uncertain in duration neither purging, bath, wine, nor any other medication may be given safely. Since it is uncertain when the fever will come, it thus happens that the fever develops suddenly and the greatest danger lies in the fact that relief has not been found.

Of the various phases of insanity which are discussed, there is one which does not begin with a fever, but finally a slight fever does arise and the patient is afflicted with sadness. Letting of blood is useful, but if anything prevents this, there should be first a purging by white hellebore (*album veratum*). Afterwards, on the second day rubbing must be employed, but if this does not help, make the patient exercise frequently. Food carefully selected should be given without wine.

Another type of insanity is characterized by hallucinations. Some are deceived by imaginations similar to those which, as the poets say, seized Ajax and Orestes when mad; others become silly. After various treatments are recommended, it is suggested that the insane ought to exercise violently, to use much rubbing, and to avoid rich meat and wine.

In diseases of the stomach, unless it is necessary, one ought not too hastily to turn to wine, but if it is feared that the patient become weak, lukewarm, sour wine must be given freely. When the patient seems to be well, one must take care lest he fall into the same weakness, therefore he ought to take stronger food each day.

omitting nothing but wine until he regains sufficient force for the body.

In phthisis is it stated that vomiting is frequent, and this is dangerous, especially so if there is blood in the sputum. If the patient begins to be slightly better, he ought to increase his exercises and nourishment, then he should rub himself while holding his breath. For a long time abstain from *vinum*, *balneum*, and *venus*—these three words are often found together in a like connection.

Epilepsy is a disease which the ancients knew very well, and there is no doubt that it was rather commonly found. Many well known historical personages are said to have suffered from it. The Romans had many names for this disease: morbus sacer, divus, Herculeus, caducus, lunaticus astralis, demoniacus, maior. Celsus calls it morbus comitialis because assemblies in the forum were broken up if one were seized with an attack. People so afflicted should avoid the sun, bath, heat, cold, wine, the sight of steep places, and of all things terrifying, vomiting, and all business.

Rarely do we see those stunned whose bodies and minds are stupified. This sometimes happens from a blow of lightning and sometimes from a disease which the Greeks call *apoplexia*. Blood should be drawn from them and wine must be avoided.

There is a disease which arises about the face which the Greeks call *spasmus cynicus*, and this is usually attended with an acute fever. The mouth is twisted with a certain motion and there is a change of color in the face and over the entire body. The patient is drowsy. In this case it is best to let blood, purge, and induce vomiting. Besides these things it is necessary to avoid the sun, weariness, and wine.

Jaundice is a disease known sometimes as *arquatum*, sometimes as *regium*. After giving a treatment of an earlier physician, Celsus adds: If there is sufficient strength, offer stronger food; if not, the food must be light. On the third day the patient ought to take a moderate amount of food and to drink Greek salt wine that the stomach may remain purged. Later he should take stronger foods and after he has gained his strength omit Greek salt wine and drink sour wine. At all times the patient should use exercises and rubbing, and if it is winter, the bath; if summer, cold swims. He should have an ornamented room, amusements, and games by which the mind is exhilarated, and on account of this it is said that this disease was called *regius morbus*.

A common disease found everywhere is the *resolutio nervorum* sometimes invading the entire body, sometimes portions of it. Ancient authors call the former *apoplexia*, the latter *paralysis*. In these cases the food ought to be selected with care and the drink should be warm water without wine; however, if the disease has continued for some time, on every fourth or fifth day Greek salt wine may be used for purging.

If there is a sharp pain in the head, it is best to abstain from food and, if possible, from drink; at least, take nothing but water. If on the following day the pain remains, purge, taking nothing but water. After the first or second day the pain will be gone entirely, providing the cause of the distress was from wine or indigestion.

Some have cured themselves of gout by drinking ass's milk, while others gained relief for the rest of their lives by abstaining from wine and *mulsum* for a whole year.

Celsus makes this statement when discussing wounds: The age of the patient, the condition of his life, and the time of year have some bearing on the recovery of the sick, because a young person gets well more readily than an older person, a strong man than a weak, an active man than an inactive, a sober and temperate man than one given to wine and lust. Wine is dangerous to those who have wounds, while there are fever and inflammation. In case of deep wounds, certain medications and plasters are recommended after which he adds that one should eat less food and that wine should be withheld. When there are deep seated ulcers and medicine does not help, one must resort to cauterizing, but in a case of this kind the patient must abstain from food and wine, and drink liberally of water, although water must not be given if there is fever.

When there is pneumonia and the whole lung is affected, the use of plasters is recommended. In addition, it is helpful while the disease is running its course to keep the patient in a room where the windows are closed, then when the fever has lessened slightly on the third or fourth day open the windows slightly to admit fresh air. During the period of recovery, abstain from wine for many days.

There is one faulty condition of the ears when they receive no sounds from the out-

side. Various causes for this condition are discussed and Celsus concludes that the patient should take care of his general health, and besides one must abstain from wine until the ringing in the ears ceases. Toothache can be numbered among the greatest torments, and while this condition exists wine must be avoided.

WINE APPLIED EXTERNALLY

There remain a few remarks concerning the use of wine as applied to the body, and in most instances it is found as one ingredient of liniments or preparations for external treatments which were applied to many parts of the body and various surface conditions; for example, eyes, ears, nose, corns, ulcers, gout, condyloma, sciatica, and many others.

When one is threatened with fever due to exhaustion, the body should be rubbed gently with oil to which wine and a little powdered salt have been added. If perspiration flows freely, the skin must be hardened by natron (*nitrum*) or by salt mixed with oil, and if this condition is rather serious, use rose or myrtle to which sour wine is added.

Cold water, wine, or vinegar may be applied to a wound to stop bleeding. In another place Celsus states that the first procedure in case of a wound is to place on it a sponge dipped in vinegar, but if one cannot endure its strength, wine must be used. When an ulcer breaks open, it should be cleansed and the flow of pus must be checked by using wine mixed with rain water in which lentils are boiled. Black ivy (*hedera*) boiled in sour wine is efficacious in case of shingles.

Ulcers are caused by the cold during winter, especially among children, and they affect particularly the fingers and toes, sometimes even the hands. If these ulcers appear, powdered alum with equal portions of frankincense (*thus*) and wine should be applied.

Dandruff exists at the roots of the hair when little scales appear, and these come loose from the skin. Sometimes these scales are moist, but more often they are dry. This condition usually occurs in the hair of the head, less frequently in the beard, sometimes even in the eyebrows. It is advantageous to remove these scales frequently by combing. If, however, this is not a satisfactory method, the head must be shaved and certain medications applied to the scalp, such as natron (*nitrum*) with vinegar, ladanum with myrtle ointment and wine, or myrobalanum with wine.

By bringing together these references which have been culled from Celsus' *De Medicina*—the Latin text of which makes a book of about 400 pages— a few conclusions may be deduced regarding the consumption of wine by the Romans, particularly from a medical point of view.

In the first place, by way of summary, wine is mentioned repeatedly as an article of diet, and this can be confirmed by numerous references in prose and poetry of classical Latin. It is of interest here to observe that medical practice also regarded wine as such. In the next place, wine was a medicine, used not only by itself for its own curative properties, but also in quite another way it was the liquid in which drugs of prescriptions were dissolved, thus forming a mixture. In the same way wine was employed in prescriptions, plasters, and ointments for external treatment and applications. Wine by itself was supposed to have healing properties when applied as external medication, and the Romans recognized it to be a cleansing agent when treating wounds.

The Romans, as well as the Greeks, were never "hard drinkers", for in their literature there are repeated references to their disgust at drunkenness. This is clearly evinced by the fact that only occasionally did they drink their wine unmixed. As we have seen, Celsus is emphatic in his warnings that under certain conditions wine must not be taken.

PHYSIOLOGY OF MICTURITION

In studying the physiology of micturition, the cystometer that Francis H. Redewell, San Francisco devised has proved especially valuable in that it records the time element during the process of filling and emptying of the bladder, thus indicating variance in tonicity of the bladder wall and making it possible to diagnose such conditions as physiologic or pathologic herniation. Barium solutions can be used as irrigating mediums to study pathologic bladder conditions with the fluoroscope. The new portable cystometer will aid materially in studies of the bladder and its action with the cystoscope and fluoroscope. With this new cystometer, the time element, as well as volume and intravesical pressure, are simultaneously recorded with ink on a tape that remains as a clean, inexpensive, permanent record. Neurogenic conditions of the urinary bladder, as well as tumors, diverticula and obstructions of the vesical neck, are more easily and quickly diagnosed in children and in adults by utilizing, along with other measures, the new cystometer.—Journal A. M. A.

STUDIES ON TUBERCULOSIS IN CHILDREN II—PULMONARY TUBERCULOSIS

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In the first paper* of this series tuberculous tracheo-bronchial adenitis was discussed. The present paper will deal with another manifestation of tuberculosis in the child: pulmonary tuberculosis.

In the Bulletin of the New York Tuberculosis Association, of 1924[1] it was stated that 16,458 cases of tuberculosis were known at that time in New York state. Of this number 4,569 were children. The findings in New York state may very well be taken as an indication of the relative number of adults and children with tuberculosis in any of the various states, and indicate the need of greater study of the disease in the child. The figures given comprise all types of tuberculosis. Many authors have called attention to the large number of children who have pulmonary tuberculosis. Gibson and Carroll[2] reported 17.3% of the children admitted to Meriden State Sanatorium in 1922 had pulmonary tuberculosis. O'Brien and Ames[3] stated that 24% of children with tuberculosis, admitted to the Boston Consumptive's hospital, had pulmonary lesions, of which 50% were below 10 years of age. Hamburger[4], in 1917, stated that 33 children out of 110 fatal cases in his care had chronic pulmonary tuberculosis. Griffin[5], in 1922, said that one out of every thousand children has pulmonary tuberculosis. In 1927, Gibson and Carroll[6] quoted the statistics from Undercliffe Sanatorium, where 10% of the children admitted during that year were diagnosed as having pulmonary tuberculosis, with twice as many girls as boys in that number.

AGE

The age of the child at the time of exposure to tuberculosis has considerable bearing upon the type of lesion which the child will develop. In early infancy, the exposure frequently results in the "Infantile Type", or generalized tuberculosis, involving the lungs as well as other parts of the body, and terminating, most frequently, in a meningitis. Myers[7] says the most favorable age of infection is from three to fourteen years. In O'Brien and Ames' series of cases mentioned before, 5% were between two and six years of age; 6% between seven and ten years; and 13% between eleven and fifteen years of age. Opie and McPhedron[8] say that manifest pulmonary tuberculosis is most frequently seen between the ages of eleven and sixteen, but that the disease may manifest itself at any time between the ages of five and twenty-one. John Guy[9], speaking of the death rate from pulmonary tuberculosis in Scotland, in 1920, stated that the death rate in children under one year was 18; from one to five years, 78; from five to ten years, 72; and from ten to fifteen years, 141. Markuson and Schatalowa[10] found 50% of children between the ages of eight and eleven years and over twelve years to belong to Ranke's tertiary stage. Gittings, Lathrop and Anderson[11] consider the prognosis bad in children who are infected after the sixth year and who develop pulmonary tuberculosis from this infection. The longer the latent period between infection and manifest disease, the better the prognosis. In the article by Gibson and Carroll quoted above[6], 32% were boys, and of these 37% were between one and ten years of age, and 63% between ten and fifteen years. Of the 68% of girls, 21.6% were between one and ten years of age, and 78.4% between ten and fifteen years.

Out of 68 children admitted to this Sanatorium in 1927, 23, or 33% had pulmonary tuberculosis. Thirteen of these 23, 57%, had cavity formation, and 18, 80%, had tubercle bacilli in their sputum or bacilli were found in feces. Five, 22%, of the 23 children were under ten years of age—one was only one year old; seven, 30%, were in their fifteenth year; four, 17%, were thirteen years old and three, 13%, were fourteen years of age. Eighty per cent of the group of 23 were girls, only one of whom was less than ten years of age. Of the five boys, three were under ten and two were over ten years of age.

TYPE OF LESION

In the infant, the generalized type of tuberculosis may be localized mostly in the lungs and may simulate an acute bronchopneumonia, or may be of a marantic type in which there are very few signs, but a prolonged wasting[12]. Watt[13] says tuber-

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culous bronchopneumonia or caseous bronchopneumonia is the most frequent form of pulmonary tuberculosis in the infant. Under five years of age tuberculous bronchitis is more frequent. Epituberculosis has been mentioned by Eliasberg and Neuland[14] as one of the frequent forms of lesion in infants. Armand-Delille[15] refers to this same form of lesion as chronic tuberculous splenopneumonia, and Ribadeau-Dumas[16] gives it still another name, calling it "Gangliopulmonary Tuberculosis." O'Brien and Ames, in the small series of cases considered by them, found the lesion in the right upper lobe in 50% of cases; in the left upper lobe in 33%, and in both upper lobes in 16.5% of patients.

PRIMARY FOCUS AND METHOD OF SPREAD

In the article on tuberculous tracheobronchial adenitis[17] it was stated that the primary focus is in the parenchyma of the lung. If this statement is accepted, we see that practically every child who is exposed has at some time a parenchymal lesion. This primary focus is rarely the direct antecedent of manifest disease. From this primary focus the disease spreads to the tracheobronchial glands along the direct communication of the lymph channels. If manifest disease appears in the parenchyma of the lung, how does the infection spread from this primary focus? There are four possible methods of spread: (1) *Retrograde lymphatic flow.* As shown in the article referred to above, this possibility is very slight. Only in the event of blocking of the lymph stream and the development of sufficient back pressure could this method of spread occur. Beitzke[18] says that even in this event the spread could be only for a very short distance. (2) *Direct extension from enlarged tracheo-bronchial lymph glands.* McPhedran[19] has stated that he has seen an occurrence of this only once in 4,000 specimens of post-mortem material. In many of the X-ray plates taken on children with tuberculous tracheobronchial adenitis, a shadow can be seen extending out into the neighboring lung field from the region of these glands which might lead to the conclusion that the disease is actually spreading from the glands into the parenchyma of the lung. Definite mottling, however, is never seen, and this circumfocal inflammation resorbs leaving no trace of its former existence. (3) *Rupture of a caseous gland into a bronchus.* This does occur, and is not infrequent. Pressure of an enlarged gland may erode a bronchus, and in a recent case observed here, a primary bronchus was eroded for a distance of three centimeters, the eroded bronchus lying in a cavity resulting from the expulsion of the caseated gland. Rupture of a gland into a bronchus may result in a spread of the disease throughout the parenchyma of the lung supplied by that bronchus. Hempelmann[20] states that rupture of a caseous lymph node into the trachea or bronchus may result in severe asphyxia of even death. Poynton and Williams[21] also refer to a case where sudden death resulted from blocking of the air passages by a caseous gland. (4) *Hematogenous spread.* Rupture of a caseous focus into a blood vessel or progression of the primary infection through the lymph stream to the venous angle and thence into the blood stream, produces hematogenous spread. Reinfection occurring either in the course of the disease or closely following it, often simulates a spread from the existing focus.

While *exogenous reinfection* may occur, the majority of authors seem to consider it relatively uncommon. Ghon[22] says the primary focus may heal but the resulting glandular infection may spread from one gland to the next, and while the glands in the lymph channels leading to the root of the lung may be healed, the gland at the junction of the thoracic duct and the vein remain active, causing endogenous reinfection.

Paraf[23] believes that after the eighth year primary infection never occurs but that activity occurring after this age is always a reinfection. In his 32 cases, 31 were the result of an endogenous reinfection.

The number of children who have come to post-mortem here in the past two years has been so small that we do not have much evidence to offer in regard to the aforementioned modes of spread. Rupture of a caseous gland has been seen as stated. In several cases, spread of the lesion has occurred in a manner very suggestive of a hematogenous spread;—that is, multiple bone and joint lesions developing in a child with tuberculous broncho-pneumonia or from an apical pulmonary lesion, tuberculosis of the genito-urinary system developing in a child with a pulmonary lesion and tuberculosis of one hip developing from or in the presence of, a tuberculous lesion in the opposite hip. None of these children has come to autopsy, except the one child with a ruptured caseous gland.

LOCATION OF LESION

Five or six years ago, several articles were written in which it was claimed that the characteristic tuberculous pulmonary lesion in the child was a basal lesion. Today the opinion has changed and it is recognized that pulmonary tuberculosis may have in the child a location similar to that in the adult. McPhedran[24] says the lesions seen by X-ray, are most frequently in the lower part of the pulmonary cone, next in order in the tracheobronchial glands and least frequently in the apical regions. Griffin[5] on the other hand, found most frequently apical lesions. In 2,000 children examined at the Lymanhurst school, 30 were found to have a pulmonary lesion, 6 of these had pneumonia, and in the remaining 24, the lesion was in the upper left lobe in 8, in the upper right lobe in 12, and in both upper lobes in 4.

In 20 children with pulmonary tuberculosis who have been patients in this sanatorium within the past year, there has been only one child with a basal lesion which was considered tuberculous; 8 of these 20 children had their lesion in the right upper lobe; 4 in the left upper lobe; 1 in both upper lobes, and in 6 practically the whole of both lungs was involved. There were four additional children with basal lesions, in whom a diagnosis of bronchiectasis was made, although the presence of tuberculosis as an etiological factor was not definitely disproven.

Gibson and Carroll[6] state that the duration of the illness in lesions in the left upper lobe is longer than in lesions in other parts of the lungs. In their series of cases, the duration in the left upper lobe lesions was three years and seven months; in right upper lobe lesions, one year and seven months, and in lesions in other parts of the lungs the duration was appromately the same as for right upper lobe lesions. No mention is made in their paper upon the type of lesion encountered, which would have a definite bearing upon the question.

NORMAL CHILD'S CHEST

In order to make a proper diagnosis of pulmonary tuberculosis in the child the physician must be thoroughly acquainted with the normal child's chest. There are a few points wherein the normal child's chest differs from that of the normal adult's chest. The normal outline of the infant's chest is cylindrical, becoming more conical or dome shaped as the child nears puberty, from which time on, the shape of child's chest is similar to that of the adult's. The anterior-posterior diameter is greater than the transverse diameter of the chest until about the third year, after which time the transverse diameter is the greater and this diameter steadily increases up to adult life. Because of the shape of the child's chest, the lungs lie more posteriorly than in the adult. In the infant the respiratory rate during sleep is approximately one and a half times as rapid as in the adult; the older the child, the less rapid the respiratory rate. Diaphragmatic type of breathing persists in the child up to the seventh year. In infants the lungs may extend unequally, one lung may seem to be carrying on respiration while the other lung appears almost immobile. The regular rhythm of respiration is not established until the end of the second year. For this reason very slight stimuli may cause a quickening of the respiratory rate. The chest walls are more elastic, due to the cartilaginous consistency of the framework, and the walls are thinner than in the adult, thi sbeing due to imperfect development of the thoracic muscles. The diaphragm is higher than in the adult. In the child the size of the trachea and bronchi is relatively larger than in the adult, hence the vocal fremitus is more intense and a bronchial fremitus may be produced by very small amounts of mucous in the bronchial tubes.

Since the chest wall is thinner, and the bronchi relatively nearer to the chest wall than in the adult, the percussion note is more tympanic and very light percussion must be used in the young child. The percussion note is exaggerated between the scapulae and beneath the clavicles, especially on the right side. Cracked-pot resonance may be elicited here, even in health. Also, in the left lower lobe the percussion note may be higher and fuller (Austrian[25], Holt[26]).

On auscultation the breath sounds in the child are normally puerile, rather rough in character, loud, and sound very near to the ear. Tracheal and bronchial sounds are more distinct since they are transmitted through a thinner layer of lung tissue and chest wall than in the adult. The breath sounds are especially loud in the inter-scapular region and beneath the clavicle, and again, especially on the right side. Holt[26] draws attention to the necessity of changing the position of very young children in order not to be misled by apparently feeble respiratory murmurs on one side. The expiratory phase is longer in the child than in the

adult. The vesiculo-bronchial respiratory murmur heard over the great bronchi has often been interpreted as evidence of pulmonary disease, as Austrian[25] has pointed out. Owing to the thinness of the chest wall it is often hard to differentiate between rales pleural in origin from those which are bronchial. Part of this difficulty may be overcome by inducing the child to cry, or in older children, as in the adult, by induced coughing.

DIAGNOSIS

Austrian[25] places no significance upon very slight impairment of resonance over the apices unless such impairment be accompanied by modifications in the breath sounds or other abnormal findings. Areas of consolidation may exist without appreciable change in the percussion note, either because they are superficial and surrounded by healthy lung tissue, or because they are overlaid with emphysematous lung. Emphysema in the child can occur very easily, but seldom persists[26]. Flatness should always suggest fluid, even the bronchial breathing can be heard over the flat area. Bronchial breathing is transmitted through the fluid owing to the nearness of the bronchi to the chest wall. Exaggerated peurile breathing may be confused with bronchial breathing for the same reason, and bronchial rales with friction sounds as mentioned before. In the presence of increased density over the bases, a history of measles, pertussis or the presence of enlarged tonsils should be sought[25].

HISTORY

With the foregoing in mind, we can proceed to the diagnosis of pulmonary tuberculosis in the child. Dunham[27] has said that we are dealing with a potentially tuberculous child rather than with a tuberculous lung. In the infant this is quite true, but the older the child, the better localized the disease becomes. The ease of diagnosis depends upon the type of chest and upon the type and form of the disease. Comparative changes must be accepted as sufficient to warrant further study. Paraf[23] lays great stress upon a past history of measles, whooping cough or influenza, and says that in the majority of cases a history of one of these will be found, the illness preceding by less than six months the beginning of tuberculosis. To these three—measles, whooping cough and influenza—Gibson and Carroll[6] add tonsilitis. In reviewing the histories of the children admitted to this sanatorium, it is exceptional to find a child who has not recently had one of the above mentioned illnesses. In the children in whom a complete history could be obtained, 85% had had measles, 61% whooping cough and 38% influenza; 23% had had a combination of measles and whooping cough and 23% had had all three—measles, whooping cough and influenza. Measles especially seems to have had a bad influence upon the resistence of the child to tuberculosis. During the course of measles the tuberculin test, which has been strongly positive previous to the onset of the measles, will become less intense, and as soon as the attack has passed over, the test will return to its former intensity, showing that during the infection with measles, the resistence of the child to tuberculosis has been broken down.

Concerning a familial history of tuberculosis, Drolet[28] says such a history in the child argues for better results in the treatment. Harbitz[29] says children of tuberculous parents are just as strong and as free from disposition to tuberculosis as other children. The majority of children admitted to this sanatorium do have a positive family history, though the course of the disease in those without such history does not seem to differ from those who have a positive history. As mentioned above, the longer the latent period between infection and manifest disease, the more favorable the prognosis[11].

SYMPTOMS

In the symptomatology of the children admitted here we find 55% complain of cough, 30% of fatigue, 43% expectorate, 25% complain of shortness of breath, and 25% sweat excessively. True night sweats are seen in approximately 33% of children with active pulmonary lesions, and elevation of temperature, especially in the afternoon, is common. Eighty per cent were 10% or more below normal weight. Pallor is often marked, even though the hemoglobin percentage is normal for the age of the child. Hemoptysis occurred in two of the twenty-three children. Anorexia, hoarseness and pleurisy have been noted by Gibson and Carroll[6]. In 27% of the admissions here in 1927, tubercle bacilli were found in the sputum. This is somewhat lower than the figures given by the above quoted authors, who report positive sputum in almost 50% of admissions. Rapid progression and regression of the lesions is characteristic of children. Many of the children admitted to this sanatorium

have been classified as "minimal" cases on the record sent out by the board of health; whereas, upon admission to the sanatorium three or four months later, the lesions are already well developed. Paraf[23] says caseation may develop within a few weeks, and that cavities can be demonstrated by the X-ray in almost all. Freeman[30] says of tuberculosis in early infancy that it is characteristic to find considerable fever, little or no increase in the leucocytes, and little emaciation.

OBSERVATION

The appearance of the child may be misleading, especially in infants. Very often the nutrition of younger children is apparently good. In older children, faulty posture, tired expression about the eyes, and moderate pallor is seen. In the older child, great inroads upon the nutrition are seen, varying directly with the extent of the pulmonary tuberculosis. Sutherland[31] refers to "the facies of tuberculosis", especially in the child; an "expression of thought upon the child's face." He also speaks of "fairy" and "manikin" types of appearance.

PALPATION

Loss of muscle tone is more noticeable in the child than in the adult, but palpation is often misleading because of the thinness of the chest wall.

In discussing the normal chest, reference was made to slight changes in the percussion note and the statement was made that such changes were of no significance unless accompanied by other abnormal findings. Impairment of the paravertebral percussion note may be due to changes around the lung root. Riviere[32] says it is a surface reflection of these distant changes.

AUSCULATION

Breath sounds which are increased, harsh or "cogwheel" type, accompanied by percussion changes, mean changes in the pulmonary parenchyma. Hutchinson[32] says rales are less frequent in the child than in the adult. What he probably means is that the lesion is not seen when rales are present, and when the lesion is discovered by X-ray or other methods, rales are no longer heard. Bronchial rales, as has been mentioned, are often difficult to differentiate from friction sounds.

X-RAY

Unless the disease is already well advanced there is a great paucity of symptoms and physical findings. The early diagnosis of pulmonary tuberculosis in the child is very difficult. It is in tuberculosis of childhood that the X-ray is of the utmost value and importance. In almost every case of tracheo-bronchial tuberculous adenopathy, the roentgen-ray plate shows evidence of present or former parenchymal activity, lesions which were too small to produce symptoms or signs and in which clinical examination failed to show the location of the lesion. Hutchison[33], Myers[37], and Chadwick[34], have all drawn attention to the presence of parenchymal shadows which have not produced clinical signs. These men are emphatic in stating that were X-ray plates of the chest made in obscure cases of low grade ailments of children, many cases would be shown to be due to pulmonary lesions. O'Brien and Ames[3] showed that 40% of their cases with pulmonary tuberculosis in children were roentgenologically positive, which lesions gave no clinical evidence of disease. For this reason they advise frequent serial plates. Riviere[12] says that the X-ray is especially important in children between one and five years of age. McPhedran[24] says "apical infiltration frequently can be recognized by X-ray in a child before symptoms appear." Bruum considers the X-ray to outrank clinical examination. In many of the early cases of pulmonary tuberculosis in children, very slight or even indefinite clinical evidence will be found which, of itself, is not sufficient to label the child tuberculous.

Serial X-rays are made in this sanatorium at intervals of three of four months, often at much shorter intervals; and in these serial plates slight changes in the pulmonary disease can be shown where clinical examination has failed to demonstrate any change, or even where clinical signs have been consistenly absent. In rereading these serial plates at the time of discharge of the child, we can often detect shadows which, seen in a single plate, would not warrant a positive diagnosis, but when the shadow is seen in a series of plates either showing clearing or progression of disease, even in the absence of clinical signs, a definite diagnosis can be made. Sutherland[30] places more value upon the fluorscopic picture in these early cases than upon the X-ray plates. While the fluorscope may show evidence of a lesion slightly earlier than the X-ray plate, the plate remains of the greater value, since the evidence presented by the X-ray plate

remains as a permanent and indisputable evidence of the presence of an infection.

SPUTUM

In speaking of the symptomatology, mention was made of tubercle bacilli in the sputum of these children. It is very difficult to teach the younger children to expectorate. The older the children, the easier it is to obtain sputum for examination, and this may account for the variation in the percentage of positive sputum found in children. At the present time an attempt is being made in this sanatorium to obtain sputum from the younger children by stimulating coughing by laryngeal swabbing. This work will be carried out on all the children who have pulmonary lesions in whom bacilli have not been demonstrated in the sputum. Bacilli have been demonstrated in the sputum of practically every case of active pulmonary tuberculosis in the adult patients here, and it is hoped that a much higher percentage of positive sputum will be found in the children.

TESTS

When tuberculous tracheo-bronchial adenitis was discussed, mention was made of various tests such as the sedimentation test, which might be of value in establishing a diagnosis or of assistance in stating prognosis. As was stated in that paper, none of these tests is of much value in establishing a diagnosis.

COMPLICATIONS

As in the adult, complications occur. Among these are: (a) Pleurisy, either with or without effusion; if effusion does develop, the effusion is rarely large enough to be recognized clinically, though recognized by the X-ray. Pain in pleurisy in the child is infrequent[20]. (b) Chronic otitis media is frequently seen both accompanying pulmonary tuberculosis and tracheo bronchial adenitis in the child. (c) Gibson and Corroll[6] have seen laryngeal involvment in several of their cases. In the children seen at this sanatorium definite involvment of the larynx has been seen only once in the past year, and that in a child with a far advanced pulmonary lesion. A constant hoarseness was present in a boy of twelve years of age without any demonstrable tuberculous laryngeal lesion, and occasional attacks of hoarseness have occurred in several children when no laryngeal involvment could be seen. (d) Empyema occurred in one child in the past year. (e) Intestinal lesions, either enteritis or peritonitis have occurred as a complication of pulmonary tuberculosis in three children. (f) Attacks of diarrhoea, especially among the younger children are not uncommon, but are not relatively more common than in so-called healthy children.

CAVITY FORMATION

Many authors have written about the occurrence of cavities in children. Mairesse[35], Randolph[36], Scholt[37], White and Carpenter[38], Asusset[39], Babeau[40], Comby[41], Delande[42], Geipel[43], Kuss[44], L'Homme[45], Laroux[46], have all reported finding cavities in the lungs of young children. In addition Ghon[47] reports cavities in 43.75% of children seen at postmortem, Ribadeau-Dumas[48] 32.3%, and Farmer[49] found thirteen cavities in 63 children. He says cavities are not exceptional in infants between six and eighteen months of age, but that the clinical diagnosis of cavity in such children is very difficult, only one case in seven giving any signs of activity. Paraf[23] contends that cavities can be demonstrated in every child over eight years of age by the roentgen-ray. Fischl[50] has shown that clinical signs are misleading and do not correspond to autopsy findings and that, therefore, cavities are often not detected during life. In looking over the X-ray plates of the children here with early pulmonary tuberculosis, I cannot find one plate which shows a clear-cut picture of cavity. Either the children coming under our care differ from those seen by Paraf[23] or we differ in the interpretation of the roentgen plates. When the disease becomes more advanced, cavity formation becomes very frequent. In the twenty-three children with pulmonary tuberculosis admitted to the sanatorium in 1927, fourteen were far advanced and six moderately advanced. In thirteen of these twenty children cavities were demonstrated, either by X-ray or clinically. In twelve of the thirteen clinical signs were sufficient to warrant a diagnosis of excavitation. In two children cavities were suspected from clinical evidence when the X-ray failed to show them, the suggestive clinical findings being caused by the enlarged tracheo-bronchial glands which were present in association with a parenchymal lesion.

Spontaneous pneumothorax as a complication of pulmonary tuberculosis, mentioned by some authors, has not been seen here. Hempelmann[20] states that spontane-

ous pneumothorax is more commonly a complication of caseous pneumonia. Since the lung tissue is more friable in the child than in the adult, rupture of lung alveoli and a subsequent spontaneous pneumothorax is a possibility, though not met with in the last two years here.

EPITUBERCULOSIS

Epituberculosis was mentioned earlier in this paper. A few words concerning this type of lesion may not be amiss. Eliasberg[14], Neuland and Hempelmann[20] describe it as follows: A chronic non-tuberculous or non-specific process, occurring in the first three years of life, insidious in onset, running a chronic course, lasting from a few weeks to months or even years, followed by complete recovery, the X-ray showing no evidence of a former activity except that the tracheo-bronchial glands remain enlarged. There is an extensive area of dulness over which bronchial breathing is heard, with few or no rales. The roentgenray shadow is a dense, homogenous shadow and corresponds to the area of dulness. The leucocytes are increased, but the differential count is nearly normal. The child coughs, but no tubercle bacilli have been demonstrated in the sputum of these children. There is loss of weight and appetite, the child reacts to O. T., and night sweats are usually absent. The elevation in temperature is less than would be expected from the extensive physical and X-ray findings. Armand-Delille[15] says he has seen epituberculosis, or, as he calls it, chronic tuberculous spleno-pneumonia, in children of eleven and twelve years of age, in contradistinction to the above authors, who place the age of occurrence between birth and three years of age.

During the past two and a half years the diagnosis of epituberculosis has not been made in a single child at this sanatorium. We have seen several children in whom the history, physical findings and roentgenray were very suggestive of the lesion described by the above authors, but in none were we satisfied with that diagnosis. Elisberg and Neuland state that the lesion is non-tuberculous, and if that is accepted, we cannot substantiate such a diagnosis in the children that we have seen here, since in every one we had reason to believe that tuberculosis was a factor in the etiology; that is, the children had a definite history of exposure to tuberculosis, and they reacted to 1/10 cc. of 1/10000 O. T. given intradermally.

PROGNOSIS

Asserson[51] has shown (a) that 46% of children placed in contact with tuberculosis develop manifest disease; (b) of those children who are infected before six months of age and who develop manifest disease, all die. Gertrude Klosteima[52] places the mortality in the first year from manifest disease at 51%. According to Nassau and Zweig[53] all children diagnosed in the first three months of life die; 87.5% of those diagnosed in the second three months die; and 30.8% of those diagnosed in the second half year of life die. Riviere[32] considers children between five and fifteen years of age comparatively exempt from fatal tuberculosis. His reason for that statement is, probably, that children during those years develop a tracheo-bronchial or other glandular lesion and not a pulmonary tuberculosis. Harbitz[29] says puberty is a dangerous age. An infection contracted before that age is liable to become reactivated at that period in life due to the altered conditions in the life of the child. Altered conditions of work, overwork, lack of sunlight and fresh air, and insufficient sleep, all tend to accentuate the dangers at this period. Among girls, especially, this period is dangerous. Frolich[54] traced 2,200 children whom he had examined when they were seven years of age. Thirteen years later he found "many of the girls had died in late childhood or after puberty," from tuberculosis, both among those who had symptoms of activity at the first examination, and among those who only reacted to O. T.

The real difference between tuberculosis in infancy and in later life, according to Bartlett and Wollstein[55], lies in the fact that practically all lesions at autopsy in children under two years of age are acute. Fibrosis is unknown and calcification rare. Calmette[56] says that resistance on the part of the body to tuberculosis commences to manifest itself, beginning at the age of four years, in its disposition to form fibrous tissue and then to resist the spread of tubercles. "Scar tissue may appear early," states Ribadeau-Dumas[57], "but the signs of healing are more frequent in older children."

In four of the infants admitted to this sanatorium in the past two years, with a diagnosis of tuberculous broncho-pneumonia, we have seen apparent regression of the disease over a period of six or eight months, with later a spread of the disease and development of lesions in other parts of the body, most likely, as mentioned

earlier, due to hematogenous spread. Among the older children there are five who have been diagnosed as having pulmonary tuberculosis previous to admission, but who now show clinical evidence of a healed lesion, with X-ray findings suggestive of former activity. Three children with minimal lesions have been discharged from the sanatorium during the past year a quiescent; four, with more extensive involvement are still in the sanatorium, but showing satisfactory progress. Six children have died of tuberculosis in this sanatorium during the past year—five of advanced pulmonary tuberculosis and one of meningitis. Bacilli have been sought for in the faeces in all of the children with pulmonary findings, when repeated sputum examinations were negative. Where there has been an advanced parenchymal lesion with cavity formation, it has been possible to demonstrate bacilli in smears made from the faeces. Guinea pig inoculation of the faeces from children with a definite pulmonary involvment, but without demonstrable cavity, has also been done, and the bacilli found in the glands and organs of the pig at autopsy in two cases. So far we have not been able to demonstrate bacilli in the smears or by pig inoculation in the minimal pulmonary cases. Tubercle bacilli were also found in the spinal fluid of the one child with tuberculous meningitis.

The number of children referred to here is far too small to form a basis for any conclusions. Hutchison and Myers[33] in thirty-eight with minimal pulmonary involvment, report nineteen as improved and four as healed; three children with moderate lesions were improved. Of thirteen children with a far advanced lesion, one is improved, one is healed; in six the lesion has advanced and five are dead. That is, out of fifty-four cases with definite pulmonary tuberculosis the mortality was almost 10%. In connection with the prognosis, it is interesting to quote John Guy[9] who says "non-pulmonary forms of tuberculosis contribute chiefly to the death rate." Laird[50] gives 10% dead, 60% well, 20% living, and 10% not traced, in the study he made upon the "Subsequent history of children discharged from a tuberlosis sanatorium." As stated in the first paper in this series, a follow-up study is now under way on the children discharged from this sanatorium, and it is hoped the results of this study can be published in the near future.

Healing occurs in the child, as in the adult, either by calcification of the tubercles, or walling off of the diseased tissue by a wall of fibrosis, with resulting contraction of the lesion. Resorption of the lesion may occur in the child, but is not so commonly seen as in the adult, since the lesions which disappear by resorption in the adult are of the exudative type, and where the exudative type of tuberculosis occurs in the child there is less likelihood of a cure. The most frequent mode of healing in the child is by fibrosis; therefore, bronchiectasis may be a sequel, and in this stage of the disease, as Riviere[12] says, it is often difficult to prove the tuberculous etiology of the lesion.

In differential diagnosis, several conditions must be considered. Whooping cough, acute bronchitis, chronic bronchitis, bronchiectasis, unresolved pneumonia, heart conditions and lung abscess are possibly the conditions most frequently simulated.

DIFFERENTIAL DIAGNOSIS

Lange[59] points out that the cough of pertussis is similar to the cough in tuberculosis, and often a diagnosis of tuberculosis is incorrectly made. Only when the symptoms point definitely to pertussis is the true diagnosis discovered.

The clinical findings in acute bronchitis are sometimes misleading in the child. Small amounts of mucous in the bronchi will produce rales which very closely simulate parenchymal rales of tuberculosis. In acute bronchitis, however, no shadow will be cast on the X-ray plate[60].

In the past two years three children have been admitted to the sanatorium suffering from asthma, who have been diagnosed as having pulmonary tuberculosis. These children all reacted to O. T., but the physical signs and the X-ray did not bear out the diagnosis of pulmonary tuberculosis. Allergic reactions were not carried out on these children so that no specific cause for the asthmatic attacks was found. In the interval between attacks physical examination failed to elicit rales in the chests of these children, though the tubular breathing, wheezing and prolonged expiration persisted.

Chronic bronchitis is especially frequent in children between two and three years of age, but is not common after the eighth or ninth year. It is a sequel to acute bronchitis, measles or whooping cough[61]. The X-ray plate may show fibrosis which persists over a long period of time.

Cavitation may occur, and bronchiectasis may follow this chronic bronchitis, as it sometimes follows pulmonary tuberculosis.

After an attack of measles or whooping cough, bronchiectasis may develop, as may pulmonary tuberculosis. The signs are frequently very similar to a basal tuberculosis and the differential diagnosis is difficult. The child may react to O. T. and the X-ray be very suggestive of tuberculosis. A history of prolonged spells of coughing with large amounts of fetid sputum (which, if allowed to stand separates into three distinct layers), and a sweetish odor to the breath may assist in making a diagnosis. Hemoptysis occurs in bronchiectasis as in pulmonary tuberculosis[61]. If the presence of an active tuberculous process can be ruled out, lipiodol may be used to outline the bronchi. The use of lipiodol, however, is far from harmless, and its use should be restricted to those children in whom every effort has first been made to rule out the presence of tuberculosis. In some children an attack of measles or whooping cough will be followed by a broncho-pneumonia, and this, in turn, have as its sequel bronchiectasis. The history in these cases is very suggestive of tuberculosis and considerable study may be necessary before the correct diagnosis is reached.

Lobar pneumonia, unresolved pneumonia, or broncho-pneumonia may be mistaken for tuberculosis. In lobar pneumonia the X-ray will show characteristic peripheral clearing. Broncho-pneumonia may leave lasting changes or consolidated areas with indefinite outlines. These shadows are most frequently seen at the bases of the lungs. The temperature elevation in these children is almost always higher than when tuberculosis is present. With tuberculous broncho-pneumonia the signs are very extensive, but the temperature and the leucocyte count are lower than in lobar pneumonia.

Congenital heart lesions and mitral valve lesions will often produce stasis in the lower parts of the lung which may closely simulate tuberculosis.

Lung abscess sometimes produces symptoms which lead one to suspect tuberculosis, but the temperature in an acute abscess is much higher than would be expected with tuberculosis, and very often there are few or no clinical findings. Here, again, the X-ray may be the deciding factor.

In the differential diagnosis of epituberculosis three conditions must be ruled out —gelatinous pneumonia, chronic broncho-pneumonia and chronic fibroid phthysis.

Gelatinous pneumonia is the first stage of a cheesy pneumonia, and is almost always fatal, lasting from two to three months . The onset is stormy, sudden—temperature is elevated, tubercle bacilli may be found in the sputum, the leucocytes are increased, and the increase is chiefly in the polymorphonuclear cells. Tuberculous foci may be found in other parts of the lungs.

From chronic broncho-pneumonia, epituberculosis may be differentiated by the history, the course, the presence of numerous rales, and the less marked impairment of resonance over the diseased area.

In chronic fibroid phthysis, the X-ray shadow is less regular and homogenous than in epituberculosis.

Pierson[60] calls attention to the shadow produced on the X-ray plate by metastatic sarcoma in the lungs, and warns that there may be some difficulty in differentiating the shadows from those produced by tuberculosis.

TREATMENT

The treatment of pulmonary tuberculosis in the child does not differ materially from the treatment of the same condition in the adult, with this exception:—healing is much slower in the child and if a permanent result is to be expected the child must be closely followed over a number of years, especially until after the child has passed through the trial at puberty. The younger the child at the time of the development of manifest disease, the worse the prognosis. Happ, Wagner[62], Gittings and Vaile[63] believe that fat in the diet has considerable influence upon the disease, both as a preventive, and to hinder the further development of the lesions. As in the adult, however, excessive fat in the diet is upsetting to the digestion and the intestinal tract of the child is much more easily upset than that of the adult. No treatment is of much value in pulmonary tuberculosis in the infant—the lesions are practically all acute, and death results frequently from a miliary spread or a meningitis.

The object of this paper is to stress the frequency of pulmonary lesions in the child and the necessity of the early diagnosis of these lesions. In the child, early diagnosis is of even greater importance than is the case with the adult; for, as has been shown, healing does not occur in the young child except under the most fav-

orable conditions, and when it does occur, a much longer time is required to cause the lesion to become quiescent. In older children, where fibrosis occurs, the same holds true and only small lesions are closed as a rule. In speaking of the results in pulmonary cases earlier in this paper, I referred to four children with moderately advanced lesions who were making satisfactory progress. Even with this satisfactory progress, sanatorium life will be the only safe life for these children for years to come, and the onset of puberty may, even under such living conditions, overthrow the work of years.

An earlier diagnosis is the best method which we have to control tuberculosis in the child. If we do diagnose the condition early, the prognosis in the older children is good, and in the younger child, much improved. More important still, by the early recognition of the disease in the family and the removal of the source of infection and the infected child, we protect the other children in that family from infection.

It may be said that the clinical signs of pulmonary tuberculosis in the child are indefinite and that a diagnosis is hard to make upon physical findings. All that is true, and only calls for closer study of the child. Suggestive findings are seldom lacking in these children, and further study, both clinically and by the roentgen-ray, will strengthen the diagnosis.

Here, again, as in the paper on tuberculous tracheo-bronchial adenitis, we reiterate the statement:—suspect tuberculosis in the child with a pulmonary lesion, and with that as a basis, admit the child to the sanatorium for further study and final diagnosis.

SUMMARY

In this paper an attempt has been made to bring out the differences in pulmonary tuberculosis as seen in the child and as seen in the adult. As has been shown, the location of the lesions in the child may be the same as in the adult, though basal lesions in the child are more commonly tuberculous in nature than they are in the adult. The frequency with which various parts of the lungs are involved does not differ materially in the child from the location in the adult, the apices being the most frequently involved.

The difficulty in diagnosing the early lesion in the child's chest has been stressed. Changes in the breath sounds, slight percussion changes, and the X-ray findings being the clinical signs upon which the diagnosis often rests. When definite rales can be made out, the lesion is no longer an early lesion. In very young children the lack of co-operation on the part of the patient is a further handicap in the physical examination. In these very young children, auscultation can best be done early in the examination when the child, owing to the strangeness of the proceeding, may cry. As the child becomes accustomed to the examination the crying will cease. The forcible breathing during the crying acts very similarly to coughing and helps in hearing the rales. This forcible breathing however, obscures other signs which may be present, and therefore the examination should be continued after the child has ceased crying.

As in tuberculous tracheo-bronchial adenitis, a history of direct exposure to an open case of tuberculosis and the general physical condition of the child must be taken into consideration.

CONCLUSION

1. The frequency with which the various parts of the lungs may be involved does not differ materially in the child from that in the adult.

2. A thorough knowledge of the normal child's chest is essential.

3. Very slight changes in percussion must be accepted as indicating some pathologic change in the parenchyma underlying the percussed area.

4. Altered breath sounds are one of the earliest changes found in pulmonary tuberculosis in the child.

5. Changes in the child's chest occur so rapidly that the X-ray picture is seldom taken close to the time of the invasion of the lungs with tuberculosis, and in the majority of cases, with the exception of infants, fibrosis will already be indicated on the film and not the cause of fibrosis, the presence of the shadow shown being sufficient evidence that a lesion has been present.

6. In obscure cases, a history of an exposure to an open case of tuberculosis is of value.

7. The general physical condition of the child must be taken into consideration in the early cases.

8. The onset of puberty is especially dangerous to the girl with an active or quiescent pulmonary tuberculosis.

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THE CALCIUM OF CHEESE

A student of nutrition will find little difficulty in securing illustrations of the unwisdom of extreme generalizations in his science. The menace of the untutored person who assumes the role of a nutritional adviser often lies in his readiness, sometimes well intentioned, to make prescriptions of diet on "general principles." Thus one might read, early in the development of the modern vitamin hypothesis, that the newly recognized food factors are thermolabile and that accordingly "heat destroys all vitamins." Such unguarded statements threw consternation into the camp of the users of all sorts of fruits and vegetables that are conventionally preserved through the heat processes of canning. The only serious warrant for this generalization is the fact that the antiscorbutic property of foods, in particular, is peculiarly sensitive to heat in the presence of air and in an alkaline medium. The thermolability of other vitamins is admittedly far less marked.

The early offhand pronouncements, however, made a rule of the exception. Again, the wide differences in the iodine content of the same species of food plant or animal in different parts of our own country indicates the necessity of accurate information before food prescriptions are formulated from the standpoint of goiter prevention. Of late, much interest has centered in the adequate inclusion of calcium in the diet. This has been stimulated by Sherman's evidence that not a small number of American dietaries appear to include the element in subminimal amounts. This is particularly true if we adopt the standard of 0.68 Gm. of calcium for an adult daily, and far more for the growing child. Milk is properly promoted as the most effective and abundant source of calcium; and milk products, notably cheese, have consequently also been lauded as acceptable calcium-yielding foods.

The approximate content of cheese in calcium is often quoted as 1 per cent—a noteworthy inclusion. The investigations of Blunt and Summer at the University of Chicago, however, furnish the basis for discriminating advice with respect to the use of cheese as a source of calcium. It is well known that there are two types of cheese, "sour milk" cheese, such as cottage chees, and rennet cheeses, which include most others. The chemical reactions in the coagulation of milk by acid and by rennet are quite different. Analyses made by the Chicago investigators have correspondingly shown that the calcium content is not only higher absolutely in the rennet cheeses but higher in proportion to the protein. Swiss and cheddar types, for example, have fourteen and nine times as much calcium, respectively, as has cottage cheese. In the words of Blunt and Summer, the latter, therefore, unlike hard rennet cheese, must be regarded as a poor source of calcium, not a rich one, as usually considered.—Jour. A. M. A., Nov. 24, 1928.

THE EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS

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The successful diagnosis of pulmonary tuberculosis by a physician is possible only when he constantly bears in mind that tuberculosis is a very widespread disease, that it is insidious in its onset and presents a great variety of symptoms. It has been well said that the first and most important point in the diagnosis of tuberculosis is to know when to suspect it. Without a suspicion of tuberculosis, the disease will pass unrecognized into and advanced stage. Fortunately, the history, when well taken, will point the way.

Loss of weight, loss of strength, malaise, lack of endurance, nervous irritability, digestive disturbances, local or generalized sweating, frequent colds, menstrual disorders, pain throught the chest, frequent clearing of the throat and hoarseness, as well as unexplained febrile temperature, cough and expectoration, and the spitting of blood are some of the symptoms calling for a careful chest examination. We must however, bear in mind that many of these symptoms may be lacking in active tuberculosis. Their absence offers no excuse for failure to make a careful study of the chest. The properly taken history will not only consider the above mentioned symptoms but will also bring out possible contact with open tuberculosis during childhood, or in later life. Many cases of bronchitis, so-called, in a parent or grandparent, are responsible for later tuberculosis in the child. Close association and repeated contacts during childhood are of especial importance. When the history has elicited suggestive symptoms, or close contact with open tuberculosis, careful search for signs of disease in the chest should be initiated.

The physical examination is carried on in a quiet, comfortably warm, well-lighted room. The patient is asked to bare the chest and sit in a comfortable, relaxed position with loose waistbands to permit of easy, natural breathing. We then proceed to elicit signs by the methods of inspection, palpation, percussion and auscultation. Inspection may reveal lagging or limited movement over an apex or upper lobe. Limited motion over the lower chest suggests fixation of the diaphragm or pleuritis. Palpation confirms the signs elicited by inspection and determines the amount of movement or limitation. It also tells us if there is any deviation of the trachea to the right or left, and the position of the heart apex. Percussion is valuable in detecting impairment of resonance over an apex or upper lobe. It also demonstrates the movement of the diaphragm by change of note in deep inspiration and expiration. The finding of slight impairment of resonance over certain areas of the chest should not, however, be taken as conclusive evidence of underlying pathology. The rotation of the spine and overdeveloped or underdeveloped musculature may be misleading if not taken into consideration. It is, however, principally upon auscultation that we must depend for physical signs in early diagnosis. We may first note the type of breath sounds and whether the breathing be distant or exaggerated, then the transmission of the spoken or whispered voice and finally, and most important, we search for rales. In order to elicit rales we should ask the patient to breathe in through the mouth, then to breathe out and give a slight cough when almost out of breath, then to breathe in again. The rales of most importance in early diagnosis will be heard in showers during the inspiration following this cough. We should look for these rales especially over the apices, below the clavicles and in the upper interscapular spaces. When the rales are persistent and localized especially in an upper lobe, they are of greater weight in early diagnosis than any other physical sign. Let it be remembered, however, that showers of rales do, occasionally, occur following influenza, as a result of clearing pneumonic areas. Persistent localized rales when heard on several occasions over a period of several weeks are, however, almost as conclusive as the finding of tubercle bacilli in the sputum. If any doubt as to the condition exists after physical examination, we should turn to the X-ray for help.

The X-ray often reveals evidence of disease which a careful physical examination has failed to bring out. This can be true only when proper technic has been used. The examining physician should always

study the films himself, comparing them with his physical findings. He should especially look for evidence of lesions in the parenchyma of the lungs, fluroscopic study is not sufficient. It gives a general idea of lung aeration and diaphragm movement but no X-ray findings can be considered complete without the study of films.

The sputum should be collected in sterile containers and sent to the state or other reliable laboratory. Many specimens may be necessary. One or two negatives mean nothing. A dozen specimens in twenty days may be necessary. Usually the early morning sample is best. Blood counts are so variable and often misleading that they may well be omitted in routine examination of the chest.

The temperature and pulse are worthy of especial study. An occasional temperature taken in the home or office is entirely unreliable. In suspected pulmonary tuberculosis, the patient's temperature should be taken for two weeks on waking in the morning, before lunch, at four and eight in the evening. The thermometer should be held under the tongue with the lips closed at least five minutes, never within a half hour after eating or drinking. A temperature of 99 degrees or more calls for an investigation as to the cause. The usual temperature in tuberculosis is low in the morning with an afternoon or evening rise. The pulse in the healthy person at rest should be normal. It is usually accelerated in tuberculosis.

Tuberculin tests are of little value in the diagnosis of tuberculosis in the adult and are best omitted except in certain obscure cases to be considered later.

Hyperthyroidism is often confused with early tuberculosis. It may be responsible for a slight febrile temperature, for nervousness, loss of weight, and rapid heart. The finding of a definite increase in the metabolic rate together with a negative X-ray and sputum should differentiate the conditions.

Bronchitis and bronchiectasis when associated with disease of the nasal accessory sinuses are often misleading. In case of repeated sputums, negative for tubercle bacilli, a careful study of the nasal accessory sinuses including an X-ray should be made.

OCCULT TUBERCULOSIS

We sometimes see patients with a symptomatology strongly suggestive of tuberculosis but in whom the physical signs are negative and the X-ray films do not show parenchymatous infiltration. Such patients may exhibit malaise, weakness, a febrile afternoon temperature, a rapid heart, nervousness and perhaps loss of weight. In such cases the thyroid should be investigated and the metabolic rate determined. The nose, throat, teeth, sinuses, gall bladder, and pelvis should be studied for possible foci of infection. If these are negative and a strong reaction to tuberculin is elicited by a moderate intra-dermal dose, then we are justified in considering that a hidden tuberculous focus is responsible for the condition and should treat the case accordingly.

The early diagnosis of tuberculosis will be made more often, when the physician has learned to suspect this disease as a possible cause of illness among those presenting themselves for diagnosis, and when a well-taken history becomes a part of the routine examination of every patient.

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MULTIPLE BIRTHS OF MONSTERS

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This case record is reported because of the large number of monsters born to these parents who are each of a twin birth.

The father, Mr. E. H. of the offspring enumerated below is a man of good health and habits, normal physique and average intelligence.

His family history is that his grandmother gave birth to two pair of twins, male and female, his mother gave birth to two pair of twins, male and female, all living, and Mr. E. H. is the male of one set of twins. There is no history or occurrence of monsters in the families of his brother and sisters.

The mother, Mrs. A. H., has had good health until after the birth of the last child enumerated below, when she was sterilized. In 1927 she developed a mild hyperthyroidism metabolism 35 per cent cured by thyroidectomy. The Wassermann reaction of both parents and the last two monsters was reported negative.

Her family history is that her great grandmother gave birth to one pair of twins, male and female, the grandmother gave birth to two pair of twins, male and female; her mother was delivered of twins, Mrs. A. H. and her brother. The male twin who is alive and single.

The following is a record of births to parents who are each of twin birth:

Preg. 1—Sept. 27, 1910	Fetus 5½ mo.	Spina Bifida
Preg. 2—Oct. 2, 1911	Full term male	Living and normal
Preg. 3—May 10, 1914	Full term male	Living and normal
Preg. 4—Aug. 23, 1915	Full term female	Living and normal
Preg. 5—Sept. 22, 1916	Full term female	Spina bifida, died 2 mo. 22 days
Preg. 6—Feb. 22, 1918	Full term female	Living and normal
Preg. 7—Nov. 10, 1920	Full term stillborn	Spina bifida
Preg. 8—Feb. 6, 1923	Full term male	Living meningocoele cervical and internal hydrocephalus.
Preg. 9—Mar. 27, 1924	Full term male	Still born anencephalic.

This last pregnancy was complicated by placenta previa and hemorrhage that nearly proved fatal to the mother.

THE VALUE OF CHOLECYSTOGRAPHY IN DIAGNOSIS

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Previous to the announcement of Graham and Cole in February, 1924, of a new method of examining the gall-bladder by means of the X-ray, the diagnosis of gall-bladder disease had not reached the high degree of efficiency for which Roentgenologists had been striving. Since Beck in 1900, showed the first gall-stone shadow, the interest of roentgenologist, internest and surgeon has become increasingly intensified. Cole, Case, Pfahler, George, Knox, Roberts and others later, through refinements in technic and improved equipment, demonstrated gall-stone shadows with increasing frequency. Later George and Leonard were able to recognize a shadow which they believed was cast by the diseased gall-bladder itself. Further work by George, Leonard, Burnham and Kirklin brought out so-called "indirect signs" of the existence of gall-bladder pathology. These indirect signs were many, but most workers agreed on gastric spasm, adhesions to duodenum and hepatic flexure, and pressure deformity of the duodenum and pyloric antrum. In spite of these advances in technic and observation, Carman said: "Previous to the advent of Graham's method, there has been nothing aside from the shadow of gall-stones, on which one could routinely base a positive roentgenologic diagnosis of cholecystic disease. A shadow of the gall-bladder itself by radiography without dye may or may not indicate a diseased condition. Secondary signs such as pressure deformity on gastric antrum, or duodenum, or deformity of the hepatic flexure, while seen occasionally in gall-bladder disease, are often present in normal cases."

Case, in 1926 in reviewing the relative values of cholecystography and the so-called direct methods of roentgenologic examination of the gall-bladder said, "Since my work with cholecystography, I have entirely abandoned any routine effort to identify on the films of a direct examination the shadow of the gall bladder." He states that such shadows are often due to stomach, duodenum or liver lobes, and that when the gall bladder is actually demonstrated on the film, it is not proof that the organ is pathological. This has been our experience, but we believe with him that the evidence often obtained by study of the gastro-intestinal tract, particularly the stomach and duodenum, cannot and should not be dispensed with.

Clinically the diagnosis of gall-bladder disease is seldom easy. It is often simulated by other conditions, cardiac disease, spastic constipation and retrocecal appendix being only a few of these. Then, too, it is often associated with other conditions, notably duodenal and gastric ulcer, and chronic appendicitis, which may entirely mask its symptoms. Angina and pylorospasm are to be differentiated, and it is well to remember that these conditions are sometimes associated with gall-bladder symptoms and pathology. Time does not permit elaboration of this phase of the problem.

Cholecystography was introduced by Graham, Cole and Copher in February, 1924. Their first published reports were the intravenous injection of tetrabromphenolphthalin. A little later this was abandoned due to certain toxic reactions and tetraiodo substituted on account of greater atomic weight and lessened toxicity. Menees and Robinson in 1925 reported results with the oral administration of the drug. Since that time the oral method has come increasingly into use, and is employed by most workers in this country today. It has been proven reliable by numerous observers and in our hands, and is the simplest and most natural mode of administration. It is an office procedure, never in any way endangering the patient or requiring hospitalization, in fact, seldom preventing the patient from going about his regular daily affairs. The capsule method of administering the drug was abandoned by us about eight months ago, the dye now being given in an emulsion form taken at one dose in a glass of grape juice, giving the freshly precipitated acid salt of the dye which is a form readily absorbed by the intestines. This makes a palatable drink, to which few patients object.

The purpose of intravenous and oral methods is the same:—To introduce the dye into the blood stream from which it is excreted by the liver into the bile and concentrated by the gall bladder to a sufficient

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density to render it opaque to the X-ray so as to cast a shadow on the films. It is a test of the function of the gall bladder. This function, so far as we know, is to concentrate and store the bile in fasting, and to discharge the bile into the intestine during digestion. We wish to emphasize that the bile must not only enter the gall bladder, but must be concentrated by absorption of the watery content, so as to increase its density sufficiently to cast a shadow. In addition to demonstrating the size, shape, contour and position of the gall bladder, this test often reveals non-opaque stones as negative density shadows, adhesions, non-appearance of shadow, impaired concentrating and emptying function, and anomalies and often aids in differentiating kidney stones and other calcifications in the upper right quadrant.

Technical work must be of the highest order, and various interpretative pitfalls avoided. Films must be of the best diagnostic detail and painstaking care exercised. The gall bladder shadow may be found anywhere from the tenth rib to the pelvis, and from the lateral abdominal wall to the mid-line and over-shadowed by the spine. Rotation of the patient to avoid gas and other intestinal shadows, and to avoid the spine shadow, is often necessary, sometimes converting an apparent no-shadow case to a normal. Gas in the intestine may be mistaken for negative stone shadows. Calcified costal cartilages, calcified glands, kidney stones, calcified tip of the 12th rib, articulated transverse process of lumbar vertebra must be differentiated from positive stone shadows, also moles on the skin, artefacts on the films, and calcifications in the liver. Coincidence of the shadow with a broad rib, or with the ilium or spine may destroy the contrast of a good shadow. Time must be spent in educating the patient to suspend respiration, as the slightest motion may render the shadow obscure, or destroy it entirely. Over-lapping of the lower pole of the kidney, and the lower border of the liver sometimes makes a confusing shadow resembling a gall bladder. A coil of small intestine, the curve of the duodenum, and sometimes the antrum of the stomach simulate faint gall-bladder shadows. Let us again emphasize that cholecystography must be careful, painstaking and often time-consuming if good results are to be obtained, and interpretations relied upon. A careless or too hurried examination is of little value, and should in no case be given credence. When there is doubt, a repeat examination should be made.

Our experience has been with the oral method entirely. We give the dye in one dose at 8 p. m. the evening before the examination, the patient abstaining from food thereafter. At 10 a. m. the first films are made, and the patient is again seen at 1 p. m., still fasting. If a gall bladder shadow is obtained, the patient is then instructed to take a meal consisting of eggs, milk and cream, and buttered toast, and to report for another examination two hours after eating. The normal response to the test is a shadow of good density at 10 a. m., usually smaller and more dense at 1 p. m., and more than half empty two hours after the fat meal. The patient is always questioned as to any reaction following ingestion of the dye, and if vomiting has taken place and no shadow appears, the examination is repeated. This has been necessary in very few instances. Vomiting is rare, and when it has occurred, it has usually not interfered with obtaining a shadow. Out of 741 examinations less than 4 per cent have vomited, 10 per cent have had diarrhea of varying degrees, and 70 per cent have had no reaction of any kind. We have come to disregard almost entirely the factor of reaction.

Interpretation is based on analysis of the function of the gall bladder as shown by the test. Chiefly, this is the ability of the gall bladder to concentrate the bile, and to discharge the bile after ingestion of food. A normal response implies a functioning liver, patent hepatic and cystic ducts, concentrating ability of the gall bladder mucosa, a normal restraining mechanism at the duodenal opening of the common duct, and a resilient gall bladder wall. Normal function implies a normal organ, but is seen occasionally in the presence of disease. We have had four cases in the last 100 operated upon, which gave normal response, but showed cholecystitis at operation. We also see good concentrating and emptying function with stones present. However, this is the exception, and not the rule.

Our most reliable sign of pathology other than demonstration of stones has been the absence of shadow. This is usually due to a functionless mucosa, blockage of the cystic duct, packing of the gall-bladder with stones, or fibrotic contracted gall-bladder. It is well to remember, however, that severe liver pathology may prevent excretion of the dye in the bile, or mechanical factors such as adhesions, extrinsic tumor, or temporary oedema of the duct

may prevent the bile from entering the gall bladder. The frequent occurrence of adhesions without any disturbance of the gall bladder shadow proves, however, that this factor seldom plays a part. Obstruction at the pylorus in oral administration is an occasional cause for non-appearance of the shadow, and this is one reason we recommend that all cases have a barium meal study of the stomach and duodenum at least. Lockwood and Skinner found that achlorhydria and excess free H. C. L. had no bearing on the result in their series. When we were using the capsule method for administration of the dye, the failure of the capsules occasionally to properly disintegrate in the intestines had to be considered. Since using the freshly precipitated acid salt of the dye in grape juice, we have not had that factor to contend with, and our shadows have been uniformly better when present, and we have felt more secure in diagnosing "no-shadow" when the gall-bladder shadow did not appear.

Cases showing very poor shadow have been as reliable an index of pathology as the no-shadow cases. The same possibilities of error here also must be kept in mind, such as possibilities of technical faults or failure on the part of the patient to follow directions.

In the faint shadows our greatest possibility of error exists. Here the personal equation enters into the interpretation. Experience and checking of surgical findings will prove valuable in minimizing mistakes in this class. The fat meal test is also of great value here. We have had many cases showing good concentrating function and poor emptying after the fat meal, which have been proven pathological by operative and pathological findings, and we believe that emptying function after a fat meal is a reliable sign of the condition of the gall bladder.

We believe with Kirklin and Watkins and Mills that normal gall bladder function can exist in the presence of cholecystitis, even with stones and adhesions. Our experience has led us to this conclusion in four cases, as mentioned above.

We wish to call attention to the fact that in several of our operated cases which had a definitely positive Graham test, the gall-bladder appeared normal and was normal to palpation, but when reluctantly opened was found to be the site of marked cholecystitis, and in several instances small stones were present, which could not be detected by the examining hand. A gall bladder cannot be pronounced normal on inspection alone. Graham believes that cholecystgraphy is more accurate than inspection and palpation at operation. His conclusions are based on the use of the intravenous method entirely.

Doubtful cases should be checked by a second examination, although our experience has been that the second examination seldom gave a different reading from the first. X-ray findings should always be considered in collaboration with the clinical findings. Close co-operation of surgeon, internist and roentgenologist are essential. Lockwood and Skinner made electro-cardiograms on 367 cases showing cholecystographic evidence of gall-bladder disease, and 71 per cent of these showed evidence of myo-cardial changes. There were three operative deaths in this series. They also saw several cases in which cholecystography helped to differentiate angina pectoris from gall bladder disease.

CONCLUSIONS

1. We believe the oral method is a reliable means of performing cholecystography.

2. Cholecystography is an improvement over the older method of X-raying the gall bladder. It is not simple. It is not infallible, and should not be done to the exclusion of the barium meal methods, but in conjunction with it.

3. Normal findings may occur in pathologic cases.

4. Cases showing positive tests and coming to operation should have the gall bladder opened before X-ray findings are discredited.

5. X-ray findings and clinical findings, should be taken into consideration together in all cases.

6. Close co-operation of internist, surgeon and roentgenologist, and pathologist is urgently recommended.

TABLE NO. 1

Last 100 cases operated upon:	
Normal diagnosis confirmed	17
Pathological diagnosis confirmed	78
Normal diagnosis not confirmed	3*
Pathological diagnosis not confirmed	2†
Percentage of acuracy of X-ray findings	95

*One had no pathological report.
†One of these not opened.

TABLE NO. 2

Last 100 cases operated upon which showed disease of the gall-bladder:	
X-ray findings pathological	96
X-ray findings normal	4
Positive stone shadows	14
Negative stone shadows	13
Stones found at operation not seen by X-ray	21
Failure of gall-bladder to visualize	39
Poor shadow	44
Poor emptying after fat meal	28
Pathological reports on	65
% of accuracy for cholecystography	96

TABLE NO. 3

Last 300 cholecystographies:	
Operated upon	62
Diagnosed normal	14
Confirmed normal	13
Diagnosed pathological	48
Confirmed pathological	47
Errors	2
Non-appearance of gall-bladder shadow in operated cases	17
Impaired function	28
Negative stone shadows	7
Positive stone shadows	7
% of accuracy of X-ray findings	96.8

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QUADRUPED LOCOMOTION (TETRAPODISIS*) AMONG HUMAN CHILDREN

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Despite the apparent novelty of quadruped locomotion among children, as attested by the recent nation-wide interest to the three articles by Ales Hrdlicka[1,2,3] there are huge populations of modern children who naturally and spontaneously employ this mode of locomotion. In fact, if the American children are given the same opportunity to realize this natural tendency as those of many foreign countries in which it is common, it is highly probable, so the author feels, that American children also would walk in this manner and there would have been no such surprised comment upon the ever-increasing number of examples now being brought to the fore.

EXAMPLES IN MODERN TIMES

In fact, the author knew of no other form of early childhood locomotion, until with much surprise he saw these reports.

In Cyprus, the author's native land, much importance is attached to the date associated with the first tetrapodisis, because of a belief that the earlier that date, the stronger and the more robust the child.

The connotation of the local word (arc(t)oudizo) means "walk like a bear" (literally translated means "imitate the bear"). The use of such a word in a country in which there are no bears implies that either the word has been imported, or has been on the tongue of the folk from a time when there were bears on the island. In the absence of any evidence that bears ever lived on the island, which otherwise would be discoverable since Cyprus has been densely populated since prehistoric times, it may be concluded that the word was imported, supposedly from a land of Greek speech, and if so, tetrapodisis ought to be common among all Greek children.

In the author's effort to establish the validity of his assumption that all Greek children at one time naturally walked on all fours, he questioned Greeks from different parts of Greece proper and from foreign parts, only and always to learn that this was the common mode of early childhood locomotion. They are always quick to add, however, without being questioned, that "some frail children creep instead because their limbs are unable to support their body in the more usual manner". Thus in this casual manner of investigation the author reached the conclusion that for the Greeks, at least, tetrapidisis is the rule, certainly not the exception.

In the belief that no little significance is contained in the similes current, it may be well to digress here to comment on the different comparisons used to indicate observation of the same phenomenon. "Walk like a bear" is readily understood by all Greeks. "Walk like a cat" is the local figure of speech in some places and "walk like a donkey" in others. In most parts of Greece proper a word probably foreign "pousoulao" is employed, the origin

* (Tetrapodisis from the verb tetrapodizein, which means walk on four feet, derived from the adjective tetrapous, which means four-footed, quadruped.)

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of which the author has been unable to trace. Therefore no translation is offered. (The nearest guess is *pous*—foot and elao or *elauno*—set in motion, proceed). In other words, where the word "walk like a bear" is not current in a given Greek community, another comparison with a different four-footed animal is in use.

To exclude the possibility of this being a peculiarity of Greek children, the author questioned Syrians, Bulgarians, Serbians, Roumanians, Poles and Russians of the laboring classes. In each case he showed them the typical pictures, published in the American Journal of Physical Anthropology, and was not surprised to find that this was considered to be the usual mode of locomotion just before walking upright. A Russian mother, herself the mother of three children who have used this mode of walking, told the author that even in Detroit about 50 per cent of all the children born to Russian parents known to her, had walked on all fours. People of other nationalities have not yet been questioned.

EXAMPLES FROM ANCIENT TIMES

From the literature, it is evident that this form of locomotion was not considered unnatural or curious among ancient Greeks or the scholars of all nationalities who have made a study of ancient Greek literature, for we find frequent references to the child's quadruped progression described in unambiguous language. Yet no scholar of any epoch or country has, to the author's knowledge, observed anything strange about it.

Everyone conversant with Greek mythology and the Greek drama, is familiar with the famous riddle, "The Enigma of Man", propounded by the Sphinx of Thebes, and its solution by Oedipous. The enigma runs as follows:

"There is a thing on earth two-footed, and *four-footed*, and three-footed, whose name is one, and it changes its nature alone of all creatures that move on the earth or in the air and sea. But when *it moves supported on most feet*, the swiftness of its legs is at its weakest." (4).

Oedipous' solution of the riddle according to an unknown poet is:

"However much against thy will, hear from me, ill-winged (ill-omened) muse of the dead, the end of thy wrongdoing; Man it is thou didst describe, who while living on earth, *is made by nature four-footed at first* when a helpless babe from his mother's womb. But when he is aged bowed down by advance-years, he leans upon a staff, a third foot, resting thereon the weight of his trunk". (4).

That the unknown author of the above enigma and its solution considered tetrapodisis a natural way of locomotion is obvious from his use of the word "tetrapous" (four-footed) and the expression "it moves supported on most feet". Likewise the expression "is made by nature four-footed at first when a helpless babe" in the solution, points in the same direction.

If tetrapodisis is such a strange mode of locomotion, how does it happen that modern scholars in mentioning this riddle and solution nowhere comment on the unusualness of this mode of locomotion? The author has examined all accessible literature on the subject in English, German and French, and found none.

John Malcolm Mitchell, an English scholar, under the word "Sphinx" in the Encyclopedia Britannica puts the same thus: "What is that which is four-footed, three-footed and two-footed?" And he gives the answer as follows: "The child crawls on *hands and feet*, the adult walks upright and the old man supports his steps with a stick". (5).

Tetrapodisis is brought out more clearly by Aristotle, who observes that "man is the only one of all animals that does not move in the same way when infant and when adult, for at first when a child he *moves like a four-footed animal*". (6).

CAUSES OF TETRAPODISIS

Thus it is evident that progression on all fours or tetrapodisis is neither a new observation nor an exception at all, but a natural condition. What then are the causes of it, or what causes the observers of today to consider it an exception?

Aristotle thinks that the cause of tetrapodisis is identical with that of quadruped progression in animals, namely, the disproportion between the upper part of the body and the lower. He calls that portion of the body from the anus to the head the upper part and from the anus to the ground, the lower. Because the upper part of the body, owing to this disproportion, "is forced to incline toward the earth, nature in the interest of security placed the front feet under four-footed animals instead of arms and hands". (7). He calls this disproportion dwarfishness or dwarfish stature and observes that "all children are dwarfs" being much more so in the very beginning of their lives, "with the result that they do not even creep, but are motionless". (7). In contrast, however,

with other animals "as they grow older the lower members of the body grow more rapidly until they attain the requisite size. Then only do children walk upright" (8). In one of Hrdlicka's reports, case No. 23 (3) a dwarfish condition is clearly indicated. It is stated that the child "has rather short legs and can put the entire palm of his hand to the floor without bending his knees". This same case brings out another point, namely, that the child in walking on all fours does not have to bend the knees. Aristotle probably thought this to be very common, for he observes: "however movement is possible, though the leg has no flexure, in the same way that children creep" (9). ("Creep" here indicates "slow movement", not "ordinary" crawling).

In trying to walk erect, the child finds its small weak legs unable to bear the load of the disproportionately heavier trunk and in falling finds itself on all four limbs. Its next move would be to stand up and walk again toward its object or proceed on all fours. Inasmuch as children in modern life are reared in homes divided into small rooms that restrict the child's activity, and the rooms are crowded with all kinds of furniture in which the child is offered many objects of support, not to mention the many kinds of "kiddy cars" and perambulators, the ordinary creeping instead of preceding tetrapodisis, immediately precedes that of upright locomotion. To all these no small part is played by the modern mother, for the children are never left alone and never have to go a long distance unaided and unobserved. If a child obliged to go to a considerable distance once found itself on all fours with no piece of furniture conveniently near, it would try to move forward in this very stable position "especially when in a hurry" as in Hrdlicka's case No. 3 (1), or would combine both modes of locomotion as is beautifully shown in Hrdlicka's case No. 22 (3), about which the correspondent comments: "occasionally, particularly after a fall, he will run a short distance on all fours, but almost immediately stands up and walks erect".

The surprise displayed in America over this seemingly strange report was to be expected. In the first place the reports reached, in large measure at least, only the educated classes, i.e., the urban population. Secondly, the American country people have departed from the more simple way of living and with their labor saving devices and luxury of life, bear a closer resemblance to the city people than to their brothers, the peasants of the old world. Still, in studying Dr. Hrdlicka's cases, we observe that in almost all cases of white children the opportunity of natural action afforded the child by the outdoors is clearly shown, although no particular attention is drawn to this fact. Hrdlicka himself remarks about case No. 2 (1) that the mother is a "young woman, evidently a poorer country woman or mountaineer". The picture of case No. 7 (2) shows an open space, that of case No. 12 (3) was taken "on the lawn". The child of case No. 14 (3) "likes to climb trees", while that of case No. 16 (3) "once in running on all fours he picked an apple with his teeth". The picture of case No. 17 (3) shows the child running outdoors. About the child of case No. 25 the correspondent comments that "it travels as much as a quarter of a mile on all fours". The child in case No. 31 (3) "has gone up small trees and posts ever since she was a child" while a picture shows her running on all fours against a background suggesting a little forest rather than a garden. The child in case No. 37 (3) "could travel across the floor or on the lawn on a run". The correspondent reporting about No. 38-40 (3) states that "when she was about fifteen months old we went to the seashore, and it is my impression it was after we went there that she began sometimes to get up on her hands and feet" and that a snapshot shows case No. 40 "going on the grass". In several of these cases no data relative to that question are given, but in two instances (cases No. 34 and No. 41) (3) it is suspected that the children lead a rather indoor life, or at least practiced tetrapodisis indoors.

A correspondent stated regarding cases No. 17-18 (3): "When I made comments on the subject others told me of knowing children who used that method of locomotion. Perhaps it is not so rare". The author finds this remark of interest as it is the only instance of expressed doubt about the strangeness of this observation.

COMMENTS

Quadruped locomotion in children is not rare.

From Greek literature we get the impression that this was considered the only natural way of progression among young children.

It is considered natural by all modern Greeks.

It is at least very common, if not gen-

eral, among the nationalities of southeastern Europe and those of the Near East.

The practice of it in the cities and modern homes is hindered because the movements of young children are very much restricted.

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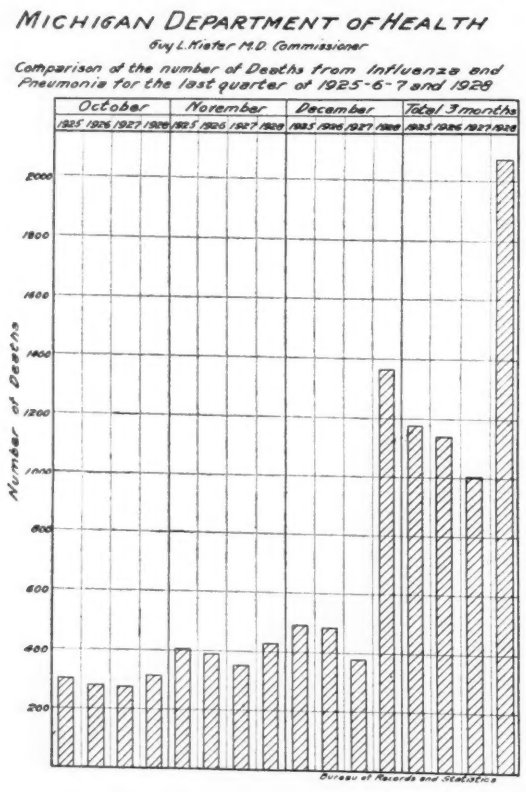
MICHIGAN'S DEPARTMENT OF HEALTH

GUY L. KIEFER, M. D., Commissioner
LANSING, MICHIGAN

INFLUENZA

Influenza is not a reportable disease in Michigan except in time of epidemics.

Last November the reports indicated that this disease was becoming epidemic on the Pacific Coast and it soon became apparent that it was moving eastward and on December 16 Dr. Guy L Kiefer, state



health commissioner, issued an order requiring the reporting of all cases. Cities were asked to send telegraphic reports of cases and the rural areas to report by mail. Between the dates of December 16 and January 20, about 33,000 cases were reported. As to how many were not reported it is impossible to estimate as many physicians did not report cases because they were atypical of the influenza epidemic of 1918.

The true measure of the disease is found in the number of deaths and while December represents only the beginning of the epidemic, these figures are now ready for study.

As in previous epidemics of influenza we find that many deaths are stated pneumonia or bronchopneumonia without reference to influenza so it is necessary to consider all deaths due to these causes.

We have therefore taken the deaths due to influenza, acute bronchitis, chronic bronchitis, bronchopneumonia, lobar pneumonia and pneumonia unqualified for the last three months of 1925, 1926, 1927 and 1928, with the following results:

Total deaths from causes above sated for October, November and December	
1925	1,172
1926	1,139
1927	1,006
1928	2,079

This shows that the number of deaths from this group in 1928 were 88 per cent higher than the average for the three preceeding years.

By whatever name it may be called there can be no doubt that *something* caused an unduly high fatality in the last quarter of 1928.

The illustration depicts the result.

THE YEAR 1928

That 1928 was a favorable year from the standpoint of health is indicated by the death rate. Although slightly higher than 1927, when the state enjoyed the lowest death rate in its history, it is below 1926 and only a shade above 1925. The rate was 11.9, this in spite of the fact that December showed an increased number of deaths due to the unusual prevalence of infections of the upper respiratory tract.

The rates for the past five years are as follows:

1924	12.2
1925	11.8
1926	12.7
1927	11.5
1928	11.9

These rates are based on the number of deaths per 1,000 of estimated population and it is true that all rates will be subject to later correction based on corrected population figures. I think that the state has fared exceedingly well.

The birth rate, however, is not so good. This again shows a decrease from the preceding year and the lowest rate probably in the history of the state. The rates for the past five years are:

1924	25.2
1925	23.6
1926	23.0
1927	22.7
1928	21.2

This falling birth rate is by no means peculiar to Michigan but seems to be common throughout the world. Many theories for this have been advanced, among them being that of the increasing industrialization of women and the exceedingly high cost of being born. It is probable that the true reason is purely a sociological one and any explanation is bound to be largely speculative.

A prenatal nursing program was started in Ingham County March 4, 1929. Miss Martha I. Giltner, R. N., who for several years has been instructor in child care classes for the State Department of Health has been selected as the nurse for this program.

Miss Giltner will work directly under the local physicians of Ingham County, though the work is financed by the Department of Health. Headquarters for the nurse will be at Mason.

Miss Nell Lemmer, R. N., of Kalamazoo, joined the nursing staff of the State Department of Health in February as instructor of child care classes. Miss Lemmer was at one time on the staff of the Kalamazoo Department of Health and later served as Ottawa County nurse. The classes at present are being conducted in Newaygo County.

VISITS OF ENGINEERS DURING MONTHS OF JANUARY AND FEBRUARY, 1929

Inspections of Railroad Water Supplies: Total 38.

Bad Axe	Hartford (2)
Baldwin	Holland
Bay City	Kalamazoo (3)
Caro	Lansing (4)
Caseville	Mackinaw City (2)
Cass City	Marshall
Cheboygan	Monroe
Detroit	New Buffalo (2)
Durand	Owosso
East Tawas	Pontiac
Edmore	Port Huron
Frankfort	Saginaw (3)
Grand Ledge	Urania
Grayling	Vassar

Inspections and Conferences, Sewerage and Sewage Disposal: Total 30.

Alma	Lapeer
Battle Creek	Montrose
Birmingham	Muskegon
Bessemer	Okemos
Detroit	Paw Paw Lake
East Lansing	Pontiac
Grand Rapids (3)	Port Huron (2)
Ithaca (4)	St. Joseph
Jackson (2)	St. Louis
Lansing (5)	

Inspections and Conference, Swimming Pools: Total 12.

Dearborn	Lansing
Detroit (4)	Port Huron
East Lansing	Royal Oak
Grosse Pointe (2)	Owosso

Inspections and Conferences, Water Supplies: Total 40.

Benton Harbor (6)	Lansing (2)
Berkley (2)	Lapeer
Caro (5)	Mt. Clemens
Dearborn	Pinckney
Detroit (6)	Plymouth (2)
Flat Rock	South Haven (2)
Grosse Pointe	St. Clair (2)
Highland Park (4)	Wayne County (2)
Ionia	

Inspections and Conferences, Stream Pollution: Total 14.

East Lansing (4)	Lansing (3)
Kalamazoo (4)	Pontiac (3)

Inspections and Conferences, Miscellaneous: Total 2.

Chicago, Lake Levels Controversy.
Memphis, School Ventilation.

Survey of School Wells:

Clinton County, 39 school well supplies were examined and samples taken for analysis in our laboratory.

Instructions have been given to the County Nurses in Livingston, Berrien, Washtenaw and McComb Counties for collecting the samples in those counties.

PREVALENCE OF DISEASE

	February Report Cases Reported			
	January 1929	February 1929	February 1928	Av. 5 yrs.
Pneumonia	1,752	1,074	798	705
Tuberculosis	361	403	538	421
Typhoid Fever	16	11	31	32
Diphtheria	430	320	300	419
Whooping Cough	628	904	655	635
Scarlet Fever	1,243	1,451	1,283	1,479
Measles	531	1,408	2,580	2,876
Smallpox	104	144	135	192
Meningitis	87	98	15	12
Poliomyelitis	4	3	5	4
Syphilis	1,536	971	1,222	1,150
Gonorrhea	927	385	586	816
Chancroid	8	1	11	11

CONDENSED MONTHLY REPORT

Michigan Department of Health Laboratories

	+	—	+—	Total
Lansing Laboratory—				
Throat Swabs for Diphtheria				1074
Diagnosis	25	317		
Release	91	266		
Carrier	25	341		
Virulence Tests	7	2		
Throat Swabs for Hemolytic Streptococci				574
Diagnosis	126	82		
Carrier	50	316		
Throat Swabs for Vincent's	91	266		342
Syphilis				7977
Kahn	1351	6540	79	
Wassermann	2	1		
Darkfield	1	3		
Examination for Gonococci	133	1470		1603
B. Tuberculosis				565
Sputum	63	459		
Animal Inoculations	3	40		
Typhoid				71
Feces	4	21		
Blood Cultures		12		
Widals	2	26		
Urine		6		
B. Abortus		20		20
Dysentery		21		21
Intestinal Parsites				23
Transudates and Exudates				255
Blood Examinations (not classified)				163
Urine Examinations (not classified)				303
Water and Sewage Examinaions				453
Milk Examinations				102
Autogenous Vaccines				2
Supplementary Examinations				148
Unclassified Examinations				749
Total for the Month				14445
Cumulative Total (fiscal year)				116958
Decrease over this month last year				357
Houghon Laboratory—				
Examinations made — Total for the month				1379
Cumulative total (fiscal year)				11690
Decrease over this month last year				1326
Grand Rapids Laboratory—				
Examinations made — Total for the month				7110
Cumulative total (fiscal year)				51935
Increase over this month last year				424
Typhoid Vaccine Distributed, c. c.				270
Diphtheria Antitoxin Distributed, units				32262000
Diphtheria Toxin Antitoxin Distributed, c. c.				22100
Silver Nitrate Ampules Distributed				6252
Scarlet Fever Antitoxin Distributed, pkg.				145
Scarlet Fever Toxin Dick Test Distributed, c. c.				2230
Scarlet Fever Toxin Immunization Distributed				4089
Smallpox Vaccine Distributed, points				14540
Bacteriophage Distributed, c.c.				2726

THE COUNTRY DOCTOR

Devotion to duty with but slight reward is a favorite theme of poets. The medical profession continues to show examples of it. A tale comes from Kewaunee, Wis., which will remind some of those who read Balzac of the sacrifices made by "The Country Doctor." The hero of this story is Dr. W. M. Wochos.

The countryside was snowbound and had been for days when a telephone call came from a farm nine miles away. A baby was to be born. The doctor started out immediately in his ski-shod motor car, but after three miles bucking the drifts he abandoned the car and won through the snow to a farmhouse from which he telephoned instructions. On a snow-plow the doctor then made three miles more, but when the plow broke down he took to his feet again, and after several hours of hardship covered the three miles—and found mother and child doing well.

Whoever has lived in the country knows at least one such example as this of medical heroism. Country doctors rarely grow rich, and if they do it is not from fees gathered at lonely farmhouses miles away in the snow. But having dedicated themselves to the care of humanity they usually go through with all the difficult phases of it, content to know that they are keeping the faith and that they have the affection and respect of their neighbors.—New York Times.

HYPERVENTILATION OF LUNGS AS PROPHYLACTIC MEASURE FOR PNEUMONIA

Yandell Henderson and Howard W. Haggard, New Haven, Conn., report that hyperventilation of the lungs by deep breathing under inhalation of carbon dioxide in proper dilution has proved effective in the prevention of postoperative pneumonia. It is effective also in the prevention of the pneumonia that may follow carbon monoxide asphyxia in untreated cases. After anesthesia and asphyxia alike, respiration tends to be depressed. During this peirod of shallow breathing, parts of the lungs may remain unventilated and thus become atelectatic. Pneumonia may develop in these areas unless special measures are taken for their reinflation. The distention of these unventilated and collapsed areas by the deep breathing which inhalation of carbon dioxide produces counteracts the atelectasis and prevents the development of pneumonia. In view of the effectiveness of inhalation of carbon dioxide in the prevention of postoperative and postasphyxial pneumonia, the possible value of inhalation of 5 per cent carbon dioxide in oxygen as a prophylaxis for the atelectasis that occurs early in pneumonia of other origins seems to deserve both experimental and clinical study.—Journal A. M. A.

THE JOURNAL

OF THE

Michigan State Medical Society

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APRIL, 1929

"I hold every man a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves, by way of amends, to be a help and ornament thereunto."

—Francis Bacon.

EDITORIAL

TUBERCULOSIS EARLY DISCOVERY, EARLY RECOVERY

Tuberculosis activities in the state of Michigan have progressed in leaps and bounds in the past twelve months. This is particularly gratifying inasmuch as the previous backward state of affairs has been finally recognized and remedies instigated and in places completed. To glory in and rest on these achievements however, would be dangerous for though the bed situation has improved in some parts of our state to the so-called standard of the National Tuberculosis Association, other parts are still struggling in that direction with definite signs of success only here and there. There are many sparsely populated counties up state which have little immediate prospect of building or procuring beds reasonably near "home." It would be a particularly worthy gesture by the state to build a sanatorium there, centrally located, and charge the individual counties their due proportion according to population, later turning it over entirely to them for maintenance in accordance with the tuberculosis act.

Spreading of the disease takes place in proportion to length and degree of exposure. A sufficient number of beds, particularly for open cases, would result in removal followed by education of the "source" of infection. Then only could we go into production in carrying out this year's slogan of the National Tuberculosis Association, namely, "Early discovery, early recovery." With the present trend of our civilization unfortunately, in spite of our high economic superiority to the rest of the world or perhaps because of it, the regular and careful habits for cure generally speaking can best be procured in an institution.

The tuberculosis death rate in the five-year age period, 15 to 19 for males is practically stationary, while in females the rate has increased so that now it is double that of males. Careful examination and continued observation where necessary of the graduates of all grammar and high schools especially girls is indicated. The line of education for this age group is suitably described by Lillian, a patient of the Detroit Tuberculosis and Health Society—"I have learned that it does not pay to skimp on food, to keep late hours, to breathe stale air or neglect a cold. I have learned, almost at the expense of my own life, the value of a good night's rest, plenty of fresh air, warm nourishing food, and regular daily exercise in the open. Without these things, no girl can keep her health long."

Until recently, the failure of early discovery has been blamed chiefly on physicians. Now, however, it is becoming more generally recognized by the lay public, that in order for the physician to discover tuberculosis early, it is advisable for patients to present themselves for examination at the very onset of symptoms. Free use of X-ray and sputum examination is necessary. Tuberculosis stands out among organic diseases as being readily influenced by mental attitude. Almost any form of treatment results in a temporary improvement of the patient. This curious psychologic fact makes the tuberculosis patient a pitifully easy victim of those who advertise or practice worthless or fraudulent "cures". In a large number of cases, too,

there is a natural tendency to quiescence and temporary arrest of the disease, causing concealment of the pathological process. In quackery, education of the public is a slow process and occasionally of doubtful value in the long run unless associated with rather than substituted for active prosecution of quacks. One cannot but agree with P. T. Barnum in that "there is a sucker born every minute". It should be added, however, that "there is a crook born every hour to look after the sixty suckers".—D. S. Brachman.

HOSPITAL STAFF MEETINGS

From time to time criticism has been made of the nature of the hospital staff programs. Among these criticisms is one to the effect that the program quite frequently consists of a paper or papers of an academic nature read by some member of the staff or by some person not connected with it. This of course is usurping the role of the county society or other organizations which exist under such names as academy of medicine, medical club or of organizations devoted to particular specialties. In fact, the paper which is more or less didactic and discussed by the members is essentially a feature of the medical meeting which is held apart from the hospital. The very reason for staff meetings consists in the necessity of dealing with matters which are peculiar and intimate so far as the particular hospital is concerned, such as the discussion of specific cases, the checking-up with post-mortem findings, or in case of recovery, with laboratory or other data in which the staff can indulge with the frankness of members of a family. Of course there are other matters that come within the scope of meetings of the staff; their significant character always that they are of immediate interest to the members and of remote interest, if any, to those not connected with the hospital.

The effectiveness of medicine depends to a great extent upon organization and cooperation among the various units, the county society, in immediate touch with the profession, the state society next and the American Medical Association final. It is by attendance at county society and cooperation in all matters that affect the medical profession that the greatest good can come to the greatest number so far as we as physicians are concerned and consequently the greatest good to the public at large. All this means that we should have clearly defined notions as to what should comprise the programs of hospital staff meetings and what should be particularly the field of the county medical society.

MALPRACTICE

The New England Medical Journal reports an informal meeting of physicians in Boston at which the subject of malpractice was discussed. Four different factors or interested groups were noted. In the case of a suit for alleged medical malpractice the State Board of Registration in Medicine is the first to be concerned, inasmuch as this board has issued a license to a person who is considered competent to practice medicine; in other words, the charge is brought against a physician whom the board has sponsored. In the second place, such suit is a matter of concern to the medical profession inasmuch as the profession should at least interest itself in everything that pertains to the practice of medicine. The New England Medical Journal maintains that this is true whether the person charged with malpractice is a member of an organized county or state society or not. Thirdly, the matter is of concern to the legal profession and its representative organization inasmuch as a lawyer is always involved. And lastly the suit is a matter of concern to insurance and other medical protective companies. Our contemporary puts forth a plea for co-operation on the part of these four interested groups. And further: "If every physician testifying in a malpractice suit knew," continues the New England Medical Journal, "that a stenographic report of his testimony were to be reviewed by the State Board of Medical Registration or by a committee of the State Medical Society that had the power to discipline him for unethical practices, he would be likely to stick closely to the facts in his testimony, and to hold his imagination in check."

Yes, if the stenographic report of a doctor's remarks could be submitted to the scrutiny of the State Board of Medical Registration, or to a committee of the State Medical Society, he would be more careful as to his testimony. He should be anyway. After all, how much of the testimony of a witness is in the truest sense fact? A bad result in treatment does not necessarily imply carelessness nor neglect. Only the physician concerned knows the circumstances with which he had to contend. If only incompetent physicians (medical license implies competence) had bad results and only the skilled physicians

had good results! Some one has said: "There is so much bad in the best of us and so much good in the worst of us, that it does not behoove any of us to talk about the rest of us." The matter recalls an illustration from Holy Writ of the accused woman who was brought forth to be stoned. When the Master requested that the accuser who had never sinned cast the first stone, all quietly vanished. Many accusations of malpractice are the result of an ill-timed remark or even a shrug of the shoulder of a doctor other than the former attendant.

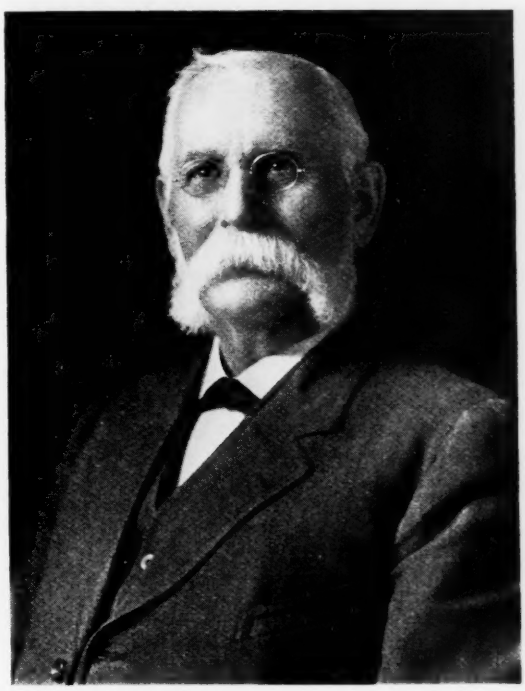
HEALTHFUL ADVERTISING?

There is an adage to the effect that,
He who has something to sell,
And goes and whispers it down a well,
Is not so apt to collar the dollars,
As he who climbs a tree and hollers.

The radio is going the arboreal shouter one better. The American people have become so concerned about their health that they will eat anything, smoke anything, or refrain from either if they think that by so doing they can attain the psalmist's limit. The medical profession, it goes without saying, has been opposed to the health motive in advertising. The war that is on between the manufacturers of certain brands of cigarettes and the making of sweets is somewhat ludicrous to the medically trained mind which as a rule does not indulge in so-called up-lift propaganda. We are probably just in the stage of wonderment as to what is good for the health in the matter of foods. For a long time calories were exploited; now it is vitamines. Children are at times punished by over-zealous parents who think they must eat only what is good for their health. Meanwhile, comparatively little thought is given to such momentous subjects as vaccination and the various forms of immunization, as these do not lend themselves to exploitation in the lay press and the radio.

PROFESSIONAL FOOT NOTES

An endeavor has been made to publish brief professional biographical notes along with each paper published whenever these were procurable in time to do so before going to press. This innovation is not original with this Journal. At least two prominent publications in the United States, namely the New York Medical Journal and Record and the New England Journal of Medicine have pursued this policy for a long time. The Journal of the Michigan State Medical Society has arranged this information in the form of foot notes, whereas the two Journals mentioned have published them all in a single column. So far as originality is concerned probably the better class of lay magazines must get the credit for it. The editor has been impressed with the little introductions which appear in these magazines as well as in the medical publications mentioned, and believes that such a policy will lend interest to the papers in The Journal of the Michigan State Medical Society. This feature has been commented upon favorably by a number of persons and so far unfavorably by none. It is understood of course that this is the editor's introduction, so to speak, of the writer and is not in any way inspired by the author of the paper.



—Photo by C. M. Hayes Co.

DR. ALBERT YATES

Dr. Yates graduated in 1872 *with the second class graduated from the Detroit college of Medicine. He practiced for fifty-five years at Washington, Michigan, being active in practice to within a few days of his death in his eighty-sixth year. Dr. Yates was among the last of a type which is fast passing away—not only physician, but friend and advisor in health as well as in illness.*

"As the years roll on
The road grows strange
The milestones into headstones change,
'Neath every one a friend."

HINTS FOR THE CONCRETE STUDY OF A ROENTGEN VIEW

Estimate every film from the negative, not from the print; the latter at the best is only an extra aid. The worst film is always better than the best copy. Viewing boxes with ground glass and direct irradiation are quite inadequate for the recognition of finer details. The best are the boxes with indirect light. For the better recognition of small shadow differences, the best way is to stand well back, and also to view the film from the sides, that is obliquely to the line of vision.

If one does not possess a viewing box:—The film should never be held direct against a source of light, but should be examined against a uniform illuminated background. The sky, uniformly clouded or unclouded, is the best for this purpose, or paper on which bright daylight or artificial light is falling.

It is possible at times to put a ground-glass at the back of the film and hold it up to direct light or the sky, but this is of use only in grosser pathological findings.

Very pale, so-called flat negatives should be laid upon white paper, pressed, best in printing frame, and so inspected.—By Kohler.

AGAINST EARLY RISING*

"When ye morning riseth redde,
Rise not thou, but keepe thy Bedde,
When ye dawne is dull and graye,
Sleepe is still ye better Way.
Beastes arise betimes;—but then,
They are Beastes, and we are men.

"Is ye Weather fayre and fine?
It shall give thee Dreams divine:
Doth it poure with pelting Rayne?
'Tis a hint to doze agayne.
Is it neither Drye nor Wette?
Waite until ye Weather's sette.

"Would'st thou walke unscavenged streetes,
Catch from shaken mattes ye sweetes,
Straye forlorn through chillie Roomes,
Stumble over casual Broomes,
Scowling house-maydes round thee scan?
These befall the earlie man.

"Morning sleepe avoideth Broyles,
Wasteth not in greedye toyles!
Doth not suffer care nor greefe:
Giveth aking Bones Releefe.
Of all ye crimes beneath ye Sunne,
Say, 'Which in morninge sleepe was done?' "

* An anonymous paper of very ancient vintage.

MORE SAYINGS OF A SEPTUAGENERIAN

By DR. C. B. BURR

Drunks and disorderlies should not take seriously the "welcome to our city" invitation.

"Facts" are less stubborn than are the self-deceived who claim to be in possession of them.

Judicious altruism is a meritorious form of egoism.

To art either in painting, sculpture, or literature "nothing that is human is alien." This is its charm and furnishes perhaps the principal reason why genuine "art is long."

The "last word" will not be written or spoken until the last day.

The head of the ostrich buried in sand to exclude painful impression is a most luminous symbol futility.

Slogans are unconvincing. For example, "Dynamic Detroit;" "In Kalamazoo We Do;" or "You'll Do Better at Smith's."

Decency in conduct is self-control based upon expediency and does not imply innocence of the realities or lack of response to urges present alike in the sage and the imbecile.

Every word here written is definite only by the use of other words which themselves need definition. Interpretations neither completely interpret nor do explanations explain.

One reason why more voices are not "crying in the wilderness" in the interest of good order, is that prolonged shouting results in hoarseness. Others are that silence is supposed to be "golden" and the vocalization involves effort. In view of all this there is willingness to concede a monopoly of pessimism to the prophets.

THE CULPRITS

When tees are green and smooth and nice?
Who waggles proudly once or twice—
And then commits a horrid slice?
My Driver!

Who helps me with my second shot,
And ought to biff it quite a lot—
But duffs the thing as oft as not?
My Brassie!

Who ought to make the ball ascend
High over bunkers and beyond—
But hooks it in the brook or pond?
My Mid-iron!

Who lays the chip-shot safe and dead—
Or makes me lift my silly head
And drop it in the sand instead?
My Mashie!

Who ought to add unto my score
Two tiny strokes, but never more—
And then takes three (or even four)?
My Putter!

In short, to close my little song,
If shots are short, or far too strong,
Who gets the blame when things go wrong?
My Golf clubs!

But when I'm fairly on my game,
Correct in strength and straight of aim,
Who gets the praise, devoid of blame?
Why, I do!

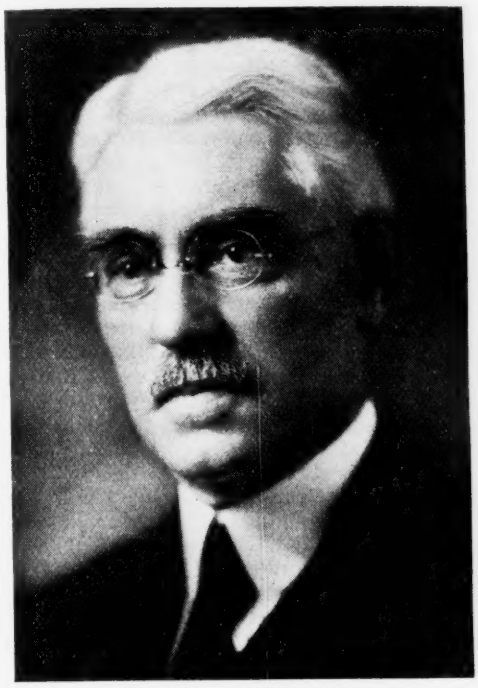
—Lucio.

DR. JAMES W. INCHES—TRAVELER AND BIG GAME HUNTER

(An Interview by the Editor)

Dr. James W. Inches left on May 12th, 1928, from Montreal on a long voyage of 7,300 miles to Capetown, South Africa. The voyage took 28 days. The sailing was smooth more particularly in the South Atlantic where one may anticipate a calm from two to three days on each side of the equator. Thence from Capetown to Johannes-

berg by rail a distance of 1,000 miles. While Dr. Inches' hunting and photographing trips were in different parts of the Transvaal, Johannesberg was his headquarters for the year. His voyage to South Africa was in response to an invitation of the Transvaal Consolidated Land Company which controls an area of approximately one-half million acres bordering on the Kruger National Park, named after Paul Kruger. Dr. Inches met the general manager three years ago when an invitation was extended him to go on a hunting expedition. There is no public hunting in the Transvaal, Dr. Inches explained. The only way that animals can be hunted is by obtaining permission



Dr. James W. Inches

of the owners of private property and after that procuring a government license, to kill a limited number of specimens during June, July and August. The other nine months of the year, he explained, constitute the closed season. "The lands upon which I hunted," said Dr. Inches, "were partly virgin territory and partly semi-civilized. Here and there pioneers open up ranches and raise cattle, corn and fruit. The climate of the Transvaal province is divided into three sections, the high veldt, the middle veldt, and the low veldt. The high veldt is 6,000 feet above sea level with a delightful climate throughout the year. It is on this plateau that Johannesberg, Pretoria, and all great gold mines of the Rand which supply 56 per cent of all the gold in the world, are located. It is a rolling prairie, no trees.

The low or bush veldt is a bush country from 600 to 2,000 feet above sea level. The climate in the bush veldt is delightful for four or five months of the year when there is absolutely no water anywhere, except in the running rivers, and consequently no mosquitoes. The rains begin in October, and after the beginning of the rainy season this is a deadly country for the white man, inasmuch as practically every white man suffers from malaria, and strange to say they take it as a matter of course and have it year in and year out. During the summer months, namely November to April, the temperature is very high. Komatipoort, 600 feet above sea level where I spent some time, is about the hottest place in South Africa. The temperature reached 110 twice in November. I have been told that on Christmas day, 1927, it was 116 all day, the lowest being 108 at three o'clock in the morning. The temperature is lowest during June, July, August, and September, when the nights are cool and the days delightful."

Dr. Inches explained that a white man could not stand the excessive heat on the bush veldt without wearing a cork helmet and a spine pad which, he explained, was made of four or five thicknesses of woolen cloth 8 inches wide and extending the whole length of the vertebral column. It was necessary to protect the spinal cord as well as the brain. This spine pad is secured to the outside of the shirt.

The doctor was very successful in his trips, securing four lions, two leopards and many fine specimens of the larger antelope family.

THE STORY OF SHIPWRECK

Dr. Inches had a very thrilling adventure on the high seas as well as a very narrow escape, after having lost all his baggage, hunting equipment, his lion and leopard skins, and also the skin of a python 18 feet 6 inches long. He had set sail from Durban on the east coast of South Africa, to New York on the Cariboo, a ship of 10,000 ton capacity, and was wrecked two days later off East London, South Africa. The doctor managed to save 5,000 feet of moving picture film which he took with him into the lifeboat, and also a number of mounted heads which had been sent by another ship. "A violent storm had arisen during the night and about 2 A. M. the Cariboo was carried on the rocks off shore near East London, South Africa, at a point often called the graveyard of the Indian Ocean. A number of ships have been lost at that point and nobody saved because of the fact that the locality is just a mass of jagged rocks, some below and some above the surface. We were saved by the fact that the storm ended suddenly about daylight and about one hour before we were compelled to take to the lifeboats. The ship was evidently about to sink. Had the storm continued at its former fury no one would have been saved. We were tossed about in the lifeboats for over two hours in a heavy swell which, however, was nothing like the terrific sea that was running when the wreck occurred. The wait of four hours on the ship, all the time talking to several other vessels, was a rather trying one. Six different ships were looking for us, and the Windsor Castle, a big ship of the Union Castle Line, we knew to be about 30 miles from us when we struck. We were continually firing torpedoes which burst with illumination high in the air in an endeavor to give our position to other shops, and as hour after hour went by, talking to our ships all the time and knowing if they did not come pretty soon we would have to take to the lifeboats with little hope of ever living in such a sea, was a trying experience. The first attempt to lower a lifeboat resulted in smashing it to pieces, but after the storm abated we succeeded in launching the boats and getting everybody into them. Only one man fell into the sea and he was recovered with difficulty. We made an effort to get our boats as far out to sea as possible in the two hours and three-quarters we were in the lifeboats because we knew that big ships would not come in near the dangerous reefs.

"At 8 a. m. we discovered smoke on the horizon which turned out to be the Windsor Castle. The hardest part of the whole wreck experience for me was climbing up the rope ladder let down to us from the side of the Windsor Castle. Getting hold of the ladder with our boats tossing about was quite difficult, but not so bad as climbing all the way up the side of the ship. I had to rest several times and at one time was afraid I might fall backward. However, I got to a point where the sailors of the Windsor Castle could assist me."

From Capetown the doctor proceeded to England on a Union Castle ship and thence to New York where he landed on January 14th, none the worse for his experience and, as he said himself, in the best health he ever knew.

(*The following letter is from Dr. B. R. Hoobler who is at present on a voyage around the world. Dr. Hoobler is a member of the Michigan State Medical Society and is also a noted traveler*).

On the Indian Ocean, somewhere between Beira and Dar Es Salaam, East Coast of Africa.

December 9th, 1928.

We have finished our tour of South Africa and are bound for Mombasa where we will again go into the interior, visiting Lake Victoria, see the source of the River Nile and then follow the Nile down through the Sudan and Egypt, coming out again to civilization at Cairo.

In this letter I want to give you some of my impressions of South Africa; already I have written you about Victoria Falls, and Cape Town. Today I want to tell you about South Africa's chief industry, viz—mining. Every mineral known and every precious stone worn can be found somewhere in South Africa. When one speaks of South Africa one thinks at once of the famous DeBeers Diamond mine at Kimberly and the Premier Diamond mine at Pretoria. From both of these mines millions of dollars worth of diamonds have been taken and are still being taken, with practically no end in sight. The diamonds are found in a certain type of blue clay which is deposited in the craters of extinct volcanoes. Sometimes this blue clay will reach to the very top of the ground and prospectors on discovering this particular kind of soil will find diamonds on the very surface of the ground, as was done in the Premier mine. This blue clay extends down into the pit of the volcano for thousands of feet as at the Kimberly mines. The surface area may be only a few square feet or run into hundreds of acres as it does at the Premier mine. The diamonds are embedded in this blue clay which was at one time moulten lava when the volcano was active, but which now is about as hard as sandstone. This material is blasted out of the pit and crushed to fine gravel by stamping mills. It is then washed in water and the fine sand is sieved out; the residue is run over wide belts covered with a thick layer of grease. The diamonds being heavier than pebbles work their way into the thick grease and are thus recovered.

THE DIAMOND INDUSTRY

Out of six tons of rock they recover on an average one carat of diamond. A whole day's work of 5,500 men will yield about $15,000.00 worth of diamonds. The yield used to be about twice that much but the deeper they go down into the volcano pit the less becomes the yield. Having started from the surface to take out this rock they have naturally dug a big hole into the earth which extends in every direction to the edge of the crater. Roughly speaking, this hole is about one-half mile in diameter and at places is 650 feet deep. They expect to work it down to 1,000 feet deep when it is thought that the expense of getting the rock up will be too great, but it will take many years to get down that deep. Men work in two shifts, morning and afternoon, some men are drilling into the rock getting ready for blasting, while others load up the fragments of rock previously blasted. It is most interesting to be there at the blasting period which takes place at 2:30 each afternoon. From three to five hundred holes have been drilled six feet into the rock in many different parts of the big hole. Into these holes a ton and one-half of 25 per cent dynamite has been placed, each hole having a fuse which it takes three minutes to burn. At a given signal three hundred men light these fuses and then run for shelter. We wait with bated breath for the first explosion to occur. We see a puff of smoke with fragments of rocks thrown into the air and then comes the boom of the explosion. Some fuses burn quicker than others, hence they do not all go off at once but vary during a space of two minutes, when there is a constant cannonading, similar, it is said, to the barages put on in the great war. The explosions taking place over five hundred feet deep into the ground with solid rock walls all about, the sound reverberates back and forth shaking the very rock on which we were standing at the very edge of this great pit. All of this occurring under a cloudless sky in full view of the whole crater filled us with awe and reminded us of the sounds which we heard at the eruption of the volcano Mona Loa. As soon as the explosions were over the thousands of workmen came rushing from their hiding places of safety, looking to us like small ants. All for a handful of diamonds per day. It seemed to us that it was a useless labor, but when one considers that diamonds are put to many commercial uses, such as the making of diamond drills, and diamond dust used in polishing, perhaps it was not all useless. However, when our guide showed us the output of the mine for one day which consisted in a handful of small stones about the size of peas, many of poor color, one carried away the impression that there was a lot of fuss for such a meagre result.

But South Africa is not only rich in diamonds, but in gold. More gold has been taken from South Africa than any other spot on the earth. Johannesburg is the center of the present mining operations. There is an area of gold bearing quartz running about sixty miles in length. On an average of every mile and in spots much less, shafts are sunk into this quartz rock. This is blasted out and brought to the surface, passed through a stamp mill and washed with water and passed over wide bands of corduroy cloth. The nap of the corduroy collects the small particles of pure gold which may have been set free in the crushing process. The material is then put into cyanide tanks and such gold as is not caught in the corduroy is changed into the cyanide of gold, and thereafter by a very ingenious chemical method is transferred into pure gold bars. The mine we visited, known as the Ferrara Deep, gets a pennyworth of gold from a ton of rock. At one time they got 30 pennyworth from a ton of rock. The average is about 10 pennyworth to each ton of rock ground up. The rock being stamped into very fine sand, is taken from the

mine as refuse and heaped in great piles which gives the characteristic appearance of Johannesburg. In the dry season when the wind blows, these great sand dumps fill the air with sand dust which sifts into every home in the city. This city is the most American city we have yet visited. One would not believe that it is but forty years old. It reminds one of Pittsburgh, Cleveland or any other active thriving American city. It is called Joburg for short. We loved it.

DR. INCHES A COSMOPOLITE

It was at Joburg that we crossed the track of Dr. James Inches, our fellow townsman, who had only the week before left for America. He is as well known in Joburg as he is in Detroit and everywhere people spoke kindly of him. A friend of his, a Mr. Selby, took us through his gold mine and later to tea at his home, where we were made to feel very comfortable, he entertaining us with hunting stories in which he and Dr. Inches were the chief characters. He is an inveterate photographer and his billiard room is replete with pictures of game and mounted heads which he has brought down in the chase. But he is now one of the directors of the National Game Reserve and delights to shoot with the camera rather than with the gun. In fact, he quite converted our friend Dr. Inches to this interesting pastime. He told us how he and Dr. Inches had set up a camera for lion pictures which was to work automatically during the night.

In the morning on returning to the place they found that their camera had been chewed into a thousand bits by ferocious lions. Mr. Selby had urged Dr. Inches to remain during the night in the shelter hiding the camera, but had he done so we would have had no Dr. Inches to regale us with stories and pictures of his African travels, and indeed we almost lost him as it was, but in quite a different way. On returning home for America he took passage on a freighter which while cruising around waiting for the storm to abate before going into harbor, struck a submerged rock and sunk. I think you have read of this in the Detroit papers. Dr. Inches was rescued but I do not know whether he saved his splendid photographic material which he took while traveling, which I understand consisted of four thousand feet of film in addition to many still pictures. We expect to be able to get some splendid views of game around Nairobi to which place we are now going. Seeing game anywhere in Africa is becoming more difficult and it will not be long before many of the species are extinct, although South Africa is beginning to appreciate its value as an attraction for tourists and under Mr. Selby's able suggestion is seeking to preserve the wild life and make it easy and comfortable for travelers to come into view of it.

VISIT MRS LEWIS OF TRADER HORN FAME

I presume most of you have read the recent popular seller in America, "Trader Horn." Some of you may have heard him speak over the radio from WEAF chain, from New York. While in Joburg we went to the pains of looking up Aloysius Horn Smith (Trader Horn) and Mrs. Etheldra Lewis, through whose patience Trader Horn's story was put into print. It was a delightful hour we spent on Mrs. Lewis' front porch sitting in the same chairs, listening to the old man unfold stories of his life in the Congo. Mrs. Lewis was indeed a wise woman to see in the old peddler who came to her doorstep to sell wire grills the man of intellect which Trader Horn has turned out to be when given nourishing food and an opportunity to unfold a story of such intriguing interest as is to be found in this early tale of life in the Congo. We had just returned from the Zambesi and as we talked of friends we had met there, and about whom we have already written you, viz, Mr. Gibson and Mr. Robin, the old man's face lighted with a smile and he told us that he knew both of these men well, having been on the Zambesi with both of them. We told them that we have spoken to them of him under the name of Trader Horn. Ah, said he, they do not know me under that name. They know me as Zambesi Jack. Then followed stories involving these three pals of the early days, all of whom are now past their seventieth birthday. It was a rare treat to have met three such characters and we feel that we were projected back nearly fifty years when Africa was indeed the Dark Continent. We have Cine Kodaks of them all and when you see them you will see the type of men who made Africa what she is today. Mrs. Lewis is an extremely busy woman, writing four to five hours each day, having completed eight books in the past seven years, all of which have had good sales.

We leave South Africa, glad indeed that we have come to know it as we have. The only thing this country needs is an adequate supply of water. Their rains come in a long and short rainy period, between which times their rivers dry up as they are not spring fed, nor fed from snow clad mountains as in our country. Severe droughts ensue with consequent loss and suffering. Sometime they may learn how to impound their water. Here's wishing them success.

B. R. Hoobler.

NEWS AND ANNOUNCEMENTS

Thereby Forming Historical Records

The American College of Physicians will hold its Thirteenth Annual Clinical Session in Boston, April 8-12. Dr. Charles F. Martin, dean of the faculty of medicine, McGill University, is president of the college this year, and Dr. John H. Musser, professor of medicine at Tulane University Medical School is president-elect and will be inducted to the presidency toward the end of the Boston meeting. Dr. James H. Means, Jackson professor of clinical medicine at Harvard Medical School and chief of the medical service at the Massachusetts General hospital is general chairman of all Boston committees having charge of arrangements for the Clinical Session of the college in April.

The program provides hospital visits, clinics, demonstrations and ward-walks during the forenoons at 15 different Boston hospitals, and for general scientific sessions each afternoon and evening in the assembly room of the Hotel Statler, which will be headquarters. Eminent authorities in their special lines will present the results of their work before an audience competent to appreciate the value of the contributions.

A Symposium on Deficiencies will take place the first evening of the session, and will be of particular interest because of the fact that de-

ficiencies are nowadays assuming a far more wide-spread and important role than had heretofore been anticipated. They have come into their own as factors producing acute and chronic disease on a par perhaps with infections. The committee has secured for the program men who can speak with authority in a variety of aspects of this important subject.

Another special feature is a review of the Present Status of Vaccine and Serum Prophylaxis and Therapy, designed to give the internist a rapid survey of the field. The speaker, Dr. Benjamin White, of Boston, is an authority on these subjects and can give the high spots in rapid and yet forceful fashion.

The annual banquet of the college will be held Thursday evening, April 11, when Dr. George E. Vincent, president of the Rockefeller Foundation, will deliver the chief address. The convocation, for the conferring of Fellowships, will take place Friday evening, April 12. Dr. Charles F. Martin, of Montreal, will deliver the presidential address.

Programs and details concerning reduced fares, admission, etc., may be secured from the executive secretary, E. R. Loveland, 133-135 S. 36th street, Philadelphia, Pa.

Dr. William Haughey, Battle Creek, has undertaken to write up the history of Calhoun County for the new history of the Medical Profession which is being written, edited and compiled by Dr. C. B. Burr of Flint. Dr. Burr and his committee would greatly appreciate the efforts of other local writers if they would put their feet on the accelerator so that the work might go to the printer as soon as possible.

Dr. Carl A. Hedblom, professor of surgery University of Illinois, delivered an address on the Etiology and Treatment of Pulmonary abscess and Dr. Willis S. Lemon of the Mayo Clinic delivered an address on the Significance of Pulmonary Hemorrhage in Diagnosis at the March meeting of the Calhoun County Medical Society at Battle Creek. The papers were discussed by Doctors William Vis, Grand Rapids, and Stewart Pritchard, Battle Creek.

Dr. H. A. Reye of Detroit addressed the Genesee County Medical Society in April on the subject of Neurosis.

Dr. Clarence Cook Little, president of the University of Michigan, addressed the Wayne County Medical Society, Tuesday, March 5th, on the subject "Genetics and Cancer." The Canti Cancer film was exhibited. The evening program inaugurated the Annual Cancer Week in Wayne County. The auditorium in the Macabees building was filled to capacity.

Dr. Angus McLean has returned to his home, Detroit, after a month in California. While in California he attended the Pacific Coast Surgical Association as delegate from the Detroit Academy of Surgery. The association was held at Santa Barbara. Dr. McLean reports an excellent program emphasizing especially the president's address by Dr. A. S. Labinger on "The Influence of the British Masters on American Surgery."

Dr. John R. Ernst, psychiatrist, lectured on Mental Hygiene to the students of the Hamtramck high school, March 5th. Dr. Ernst will give four other lectures on this subject, two at the Northwestern and two at the Southeastern high schools. These lectures are being given under the auspices of the Joint Committee on Public Health Education, Extension Division of the University of Michigan.

Dr. John R. Ernst, writes us: "Your editorial on, 'Scarcity of Psychiatrists,' in the March issue is timely and should be followed up. There are only four psychiatrists listed in the classified list of physicians in the Detroit telephone directory. They need all the encouragement you can give them."

Dr. J. S. Morrison, Royal Oak, writes: "The Journal M.S.M.S. is up to the minute and on its toes so to speak; I got a lot of 'kick' out of the March number. Every physician in Michigan ought to be a reader. More power to you."

DEATHS

DR. FRANCIS J. MAGUIRE

Dr. Francis J. Maguire of Detroit died at Grace hospital early in February, at the age of 59 years. Dr. Maguire was born in Hamilton, Ont. About 1892 he moved to Detroit and took up the study of medicine and surgery at the Detroit College of Medicine. He graduated in 1896 and started practicing medicine and surgery soon after. At one time he was connected with the surgical staff of Harper, Grace and Providence hospitals of Detroit. He was a member of the Wayne County Society, member of the Michigan State Medical Society, and a fellow of the American Medical Association. He also was a member of the Detroit Athletic Club and the Detroit Yacht Club. He is survived by his widow, a brother Arthur, an attorney of Detroit, and a sister, Mrs. William E. Clarke of Toronto, Ont.

DR. CHRISTINE LUKAS

After an illness of several months, Dr. Christine Lukas, 38 years old, 1709 East Grand boulevard, died in Harper hospital February 26th. She had been a practicing physician in Detroit since 1917. Born in Mainz, Germany, she came to the United States in 1897. She was graduated from the medical school of the University of Illinois in 1913, after which she served her interneship in the Cook county hospital, Chicago.

Dr. Lukas was a member of the Women's City club, Detroit Turnverein, Alpha Epsilon Iota sorority, Wayne County Medical Society, Michigan State Medical Society and the American Medical Association.

She leaves her mother, Mrs. Elizabeth Lukas.

DR. ALBERT YATES

Dr. Albert Yates of Washington, Macomb County, died at his home on February 26th after a brief illness. Dr. Yates was 86½ years old at the time of his death and was the only surviving member of the class of 1872 of the Detroit College of Medicine. He was born at Lincolnshire, England, migrating with his parents to Canada when he was seven years old. His preliminary

education was obtained in the Public Schools at Hamilton, Ontario. Attaining his young manhood he came to Detroit and enrolled in the Detroit Medical College, then only in existence about three years. He was a member of the second class to graduate from the institution. After his graduation he practised medicine for a few years at West Lorne, Ontario, moving to Washington 55 years ago. Dr. Yates was active in practice, taking care of the medical needs of pretty much the entire township all this time. Not only was he a devoted physician but filled in an honorable way the civic duties which were entrusted to him. He was President of the Washington Savings Bank up to within three months of his death, during which period he was made Honorary President. Dr. Yates is survived by eight children, Dr. H. Wellington Yates, Mrs. F. W. Springstein, Mrs. Robert Jean, Detroit; A. E. Yates, New York City; Mrs. Minnie Hartley, Mrs. J. H. McCutcheon, Washington, Mich., Mrs. F. B. Childs, Chicago, and R. L. Yates, Erie, Pa.

DR. THOMAS J. FOSTER

News has been received of the death of Dr. Thomas J. Foster, Highland Park, Michigan. Dr. Foster located in Highland Park eleven years ago, coming from Scottville, Michigan, where he had practiced about twenty years. He was an active member of the Highland Park and Wayne County Medical Association, and the Michigan State Medical Society. He leaves a wife, Mrs. Evelyn Foster; a son, Robert; two brothers, Dr. R. F. Foster, his associate, and William J. Foster of Saskatoon, and two sisters, Mrs. William Thompson and Mrs. Mary Brundedge.

DR. SAMUEL S. C. PHIPPEN

Dr. Samuel S. C. Phippen, one of the oldest and best known physicians in Shiawassee county, died suddenly at his home in Owosso, March 12, 1929.

Dr. Phippen was born in Canada and was nearly 69 years old at the time of his death and had practiced his profession in Owosso from the time of his graduation from McGill University in 1883.

He was a member ofthe several medical societies, a Knight of Pythias, an Elk and a Mason. The burial services on March 14th in Oakhill Cemetery, Owosso, were conducted by the last mentioned order. He is survived by his widow; the only other relative, a brother, died in Sarnia, Ont., a few months ago. The Shiawassee County Medical Society attended the funeral in a body.

COMMUNICATIONS

Editor of the Journal of the Michigan State Medical Society:

In my essay, "Some Observations in Otolaryngology at the Vienna Clinics," published in the November 1928 issue of the State Journal, I made the following statement: "Professor Alexander does not advocate a tonsil and adenoid operation before the child reaches six years of age. An operation done before this age—may cause a hypertrophy of Gerlachs tubo-tonsil with a consequent chronic catarrhal otitis."

Professor Ruttin wrote me recently that this observation was not made by Professor Alexander but by Professor Ruttin himself. Publication of this paper will give proper credit to Professor Ruttin.—S. E. Barnett.

MALARIAL INFECTIONS

J. H. J. UPHAM, M. D.
327 East State Street
Columbus, Ohio

March 18, 1929.

Dr. F. C. Warnshuis,
1508 G. R. National Bank Bldg.,
Grand Rapids, Mich.

Dear Fred:

Thanks for sending me the current number of your Journal. I have taken time to go over it and want to congratulate you on its excellency in every department. In connection with the article on "Paresis," I was reminded of a curious happening here last fall. Our State Hospital for the Insane is located on the west side of this city. A number of cases of paresis have been treated there by malaria inoculations. We have had no malaria in Columbus for years. I was therefore rather surprised on being called in consultation to a house not far from the hospital to find a case of tertian malaria. About a month later, I saw two more cases. I questioned the superintendent as to the possibility of his patients being the source of infection. He admitted the possibility as no precaution other than ordinary window screens were used in the hospital and he would use more care in screening his patients thereafter. Of course this may not have been the source of infection, but I am wondering if extra precautions should not be taken where this treatment is employed.

Very cordially yours,
John H. Upham.

ADENOMA AND CANCER OF THYROID

In a study made by Frederick A. Coller, Ann Arbor, Mich. (Journal A. M. A., February 9, 1929), of goiters from a severe goiter area removed surgically, 90 malignant epithelial neoplasms of the thyroid were found, comprising 4 per cent of all endemic goiters. A history of preexisting goiter was present in 75 per cent, but microscopic examination showed evidence of its origin from some type of endemic goiter in all except one instance. This exception arose from the hyperplastic gland of exophthalmic goiter. Of the patients, 72.2 per cent were female and 27.8 per cent were male, the same ratio that exists in the total number with endemic goiters. The ages varied between 14 and 72, with 34 per cent occurring before 40 and 56 per cent between the ages of 40 and 60. The chief leading symptoms were those associated with hyperthyroidism; next in frequency were pressure symptoms, while rapid growth was noted in only 15 per cent. Of those examined, 46 per cent had an abnormally high basal metabolic rate. Correct preoperative diagnosis was made in only 25 per cent, while in 47 per cent the diagnosis was unsuspected. Histologically, 28 per cent of the growth were medullary carcinoma, 66 per cent adenocarcinoma and 5.5 per cent scirrhous carcinoma. A large number of adenocarcinomas were confined to adenomas. These should be considered true early carcinomas of the thyroid. Adenoma of the thyroid is a precancerous lesion with a small but definite incidence.

COUNTY SOCIETY ACTIVITY

Revealing Achievements and Recording Service

EDITOR: Frederick C. Warnshuis, M. D.
Secretary Michigan State Medical Society

COUNTY PROGRAMS

Dr. A. A. Hayden, in commenting upon this subject at the State Secretaries Conference made the following pertinent statement: "If you are going to have good attendance at your county meetings you must give the members something that will repay them for their time and trouble of attending. Always have a program, and always have something of practical importance to a majority of the membership."

Experience, nation wide, confirms this statement. Upon the County Secretary or Program Committee rests the responsibility of building up attractive, attendance compelling programs. If the Secretary is lax or careless in this respect it is reflected in poorly attended meetings. It is for you, Mr. Secretary, to determine how your society is to be rated.

DUES

By-laws compel us to place on the suspended list all members whose dues are not paid by April 1st. If your dues are not paid we have no alternative but to record you as suspended, discontinue your Journal and withdraw the Medico-Legal protection. Do not become negligent and cause such action on your part. It might be costly. Just this last year a certain member permitted his dues to lapse for two months. Later he had to employ an attorney to defend himself in a suit for services rendered during his period of suspension.

Send your check today to your County Secretary. County Secretaries are requested to send in a report of all members delinquent on April 1st.

QUACK AND DRUG ADVERTISEMENTS

We wonder why the recent epidemic of 'flu" or "grippe" occurred. When one turns to the daily papers we find dozens of advertisements of drugs, gargles, sprays and pills practically guaranteeing to prevent or cure the "flu". Apparently there is cropping up anew a wave of quack and nostrum advertising. Our papers are accepting these advertisements, disregarding the merit of the drug or the truthfulness of the copy. Is it not time to recommence a campaign of exposure of these fakes and to re-educate newspaper editors and managers?

NURSING EDUCATION

President Hirschman has appointed the following committee to represent our Society in a conference that is to take up the problem of nursing education in Michigan hospitals: Doctors J. G. R. Manwaring, Flint; C. E. Boys, Kalamazoo, and F. C. Witter, Detroit.

Dr. C. E. Stewart, President of the Michigan Hospital Association, has appointed the following committee: Doctors Harley A. Haynes, Ann Arbor; W. L. Babcock, Detroit, and Stewart Hamilton, Detroit.

The two committees have arranged for a joint meeting. It is confidently hoped that from this conference there will emanate a plan to simplify the nursing education curriculums and relieve hospitals of this expensive burden.

SUITS FOR MALPRACTICE

Mr. Barbour, our Medico-Legal attorney, writes under date of February 28th: "It is my opinion that you should start a campaign to educate doctors to the necessity of using X-ray in fractures, and especially fractures of the hip. If the patient refuses, then the doctor should refuse to give further treatment, notifying the patient by registered mail as to the need of an X-ray and as to why the doctor is leaving the case if his advice is ignored."

Mr. Barbour further adds: "Also educate the doctors to use extraordinary care in the use of the X-ray, lights and electrical appliances of all kinds. These cases are very difficult to defend and on account of the serious injuries that result, large verdicts are probable."

He then goes on to cite recent cases wherein large verdicts were awarded for the failure to use the X-ray. A case is also cited in which a verdict of $3,000 was awarded from diathermy treatments.

Trials can be won and verdicts prevented in cases when the doctor attending has

been careful and where the charge of negligence can not be substantiated. When a preponderance of evidence is introduced showing that the doctor was negligent, that he failed to use the X-ray, that he was careless and that his electrical treatments were faulty, then an adverse verdict is the rule.

You may be ten or twenty miles from an X-ray, still Mr. Barbour states: "It is my judgment that the Supreme Court would hold that it is negligence not to suggest and secure an X-ray, when it is customary to take or send a patient to a neighboring town for an X-ray." As the attending doctor it is your responsibility to use the X-ray in the treatment of fractures and failing to do so you make yourself liable.

Mr. Stryker, legal counsel for the New York State Medical Society, in the February issue of New York State Medical Journal admirably enumerates certain rules which every physician should have in mind whenever he is called to treat a patient:

First: Before consenting to treat or operate upon a patient, the physician should honestly inquire of himself whether or not he is in fact competent to treat or operate for the particular condition or ailment which he finds. Medicine of late has become more and more specialized. Men who are expert in one branch, may have had little or no experience in another. Make sure that you are really competent to treat or operate for the particular condition which confronts you. If you have any doubt upon the subject, call in one of your professional brethren who is expert in the particular subject involved, and see to it that he is employed as a consultant or that he actually renders the treatment or performs the operation in question.

CARE IN DIAGNOSIS

Second: Be careful of your diagnosis. Make sure before you arrive at a conclusion that you have ascertained, weighed and duly considered every relevant fact, including every detail of the history, and that you have considered the special systemic factors present in the particular patient. Be sure to utilize every diagnostic aid which science has made available. These would include X-ray, urine and blood tests, pathological and microscopical examinations. If you have any honest doubt as to the correctness of vour diagnosis after you have weighed and considered every possible fact which should be made a basis thereof, call in another physician for a confirmation of your diagnosis. A differential diagnosis is ofttimes extremely difficult. Sometimes the ablest physicians have diagnosed the condition of a woman as suffering from a tumor, and upon this diagnosis have operated, only to find that upon an examination of the uterus the woman is not suffering from a tumor, but is in fact pregnant. Sometimes a rigid examination of the patient as to her menstrual periods, the last date of intercourse, and other questions will render such a faulty diagnosis improbable.

IMPORTANT PRECAUTIONS

Third: In all questions of surgery, consider first whether in fact a surgical operation is required. In case of doubt between a radical or a less radical course, consider carefully whether or not the less radical procedure is not the one first to employ. In connection with surgical operations, consider carefully the kind of anaesthesia to be employed. Some anaesthesias are proper in some instances, and improper in others. Which one is proper depends upon a variety of circumstances, among which are the strength and age of the patient, the patient's heart and many other circumstances. Be careful to inquire whether cocaine has been administered within a short time before the administration of the general anaesthesia. Also inquire from the patient's history whether he or she has any iodiosyncrasy for any particular form of anaesthetic. In the administration of the anaesthesia, make sure that the anaesthetist is competent and understands his or her duties. If possible, have a physician act as the anaesthetist rather than a nurse. Make sure also that care has been employed in the matter of enemas, and in seeing to it (except in cases of emergency involving life or death) that the anaesthetic, if it is a general one, is not administered to a patient with food in the stomach. Consider carefully whether or not a general or a local anaesthesia is the one of choice. This may depend upon a variety of circumstances, including the condition of the patient, the nature of the operation, etc. Before performing the operation, make sure that every antiseptic precaution has been taken according to the most approved methods. This includes not only the sterility of the operator and of his instruments, but of all those who participate in the operation, such as the so-called sterile nurse, etc. Then, too, in performing the operation make sure that a careful sponge count is made—that the number of sponges or packs placed within the body of the patient are counted, and the number which are removed are likewise counted, so as to be certain that no foreign body remains after the incision has been closed. Before calling for the sponge count make a careful personal inspection of the operative field to assure yourself that no foreign body is remaining, and put a record of this inspection on the hospital chart, have it done in the presence of the witnesses and have them sign the chart showing that this inspection has in fact been made.

KEEP CAREFUL RECORD

Fourth: Keep careful records. This applies not only to the records of the office, but to the records of the operation and of the treatment in the hospital. It is wise in every case to have the patient consent in writing to the operation, which consent should contain a brief statement showing that he or she understands the nature of the operation, and the possible outcome. Where a patient insists upon leaving the hospital against the doctor's advice, make sure that a statement is signed by the patient setting forth that fact. Where one physician desires, or through circumstances beyond his control is forced, to relinquish a case to another physician, cause the patient to consent to this course in writing.

Fifth: Make sure that all your instruments and appliances are of the most approved design and make, and are in proper working order. This applies not only to the operative instruments, but to the operating tables, chairs and all other appliances. Especially is this true in connection with the use of surgical needles. Make sure that

the needles are secured from some well-recognized manufacturer, and that the needle employed is of a size and strength requisite to the particular demands which will be imposed upon it.

Sixth: In all treatments and all operations, make sure that the methods employed are the proper and approved methods in general use. Do not use antiquated methods, nor employ new methods which have not yet received the sanction of the profession.

Seventh: Keep abreast of the times. Read the medical journals and the new textbooks. Keep your knowledge fresh and up-to-date. Attend your County Medical meetings where you will hear papers read of great scientific value.

Eighth: Be conservative in your prognosis. Unjustified promises have often led to disappointments, which in turn have resulted in malpractice actions. Do not promise what you are not certain of delivering.

RADIO THERAPY SHOULD BE MASTERED

Ninth: One of the most productive sources of litigation is that of X-ray therapy and diathermy. Do not attempt to do X-ray therapy or diathermy unless you understand it. A physician who merely purchases an X-ray machine and follows the instructions of the salesman or of the circular of the manufacturer, is indeed assuming a large hazard. X-ray therapy is a highly technical specialty. New discoveries and new theories are constantly evolved. The proper factors of dosage and other factors require a knowledge of the best and most recent thought upon the subject. In determining the factors, make sure that you have made a correct computation, and that you are using the proper factors generally recognized as such at the time the therapy is administered. In quire carefully to determine whether or not the patient has had a previous exposure of X-ray within a time that would render it unsafe for you to subject him or her to a new exposure. Make sure that your machine is in proper working order, and that there are no loose wires with which the patient or the friend or parent accompanying the patient, may come in contact. Many actions have arisen in this way. In administering this therapy, make sure that the proper intervals between doses are maintained.

AVOID CRITICISM

Tenth: Be tactful and just to your fellow practitioners. Do not indulge in needless criticism. Careless remarks, oftimes unjust, have led to litigation.

Eleventh: In treating your patient or your patient's family, exercise the highest possible degree of care and good faith. Be scrupulously honest in your advice and in your treatment. Do not give your patient any basis for the claim that you have been guilty of abandonment. If you cannot continue with the treatment, make sure that you have supplied a successor physician of talents equal to your own, and that the patient consents to this substitution. In every dealing with a patient or with the patient's family, if you are certain of your diagnosis and if you have considered and mastered every technical question of medicine or surgery which may be involved, let your conscience be your guide. Establish a reputation for good faith and fair dealing at all times with everyone.

I do not mean in this paper unduly to stress the importance or the dangers of surgery. The general practitioner bears the same responsibility and is required to exercise the same amount of care, foresight, skill and knowledge as the surgeon. A large number of our malpractice actions have been brought against the general practitioner.

No doubt, the foregoing rules might be amplified, but from my observation in the handling of approximately one thousand malpractice actions I believe that if each and all of the foregoing rules had been complied with, a large number of the cases which I have had to defend would not have been brought at all. The practice of medicine is an extra-hazardous one. This should be recognized at the outset. The doctor has great obstacles to overcome. Many opportunities for observation have increased my sympathy with and my understanding of the problems which confront the medical profession. The foregoing rules which I have endeavored to enumerate are based upon a long and wide experience. They are not stated in any spirit of criticism of your profession, but rather insofar as they may be helpful, as a guide.

ACTIVITY

The last week in February was cram full of legislative activity. Please refer to the March issue and also this number for legislative reports. It sure was a "heck of a winter" filled with intense longings to hie away to the south with its sunshine and fishing. We envied those who were able to do so. And now comes the spring rush, conferences, clinics, post-graduate courses, legislative watchfulness, plans for the annual meeting, committee work—one must be on their toes lest they "fall down with a boom." Most of our County Societies are commendably active. Others are dormant or else permit hospital staff programs to usurp their activity. Staff programs should be limited to administrative affairs. A joint committee has been appointed to solve the problem of nursing education in Michigan. Our State Commissioner of Health wants the individual doctor to sell vaccination toxin-antitoxin, typhoid inoculation and similar preventive measures to your patients. It is your right and privilege to do so. It is your responsibility to tell the patient: "It's time for Jimmy or Jennie to be vaccinated or inoculated," and you should make the appointment. Unless you, the family doctor, do so arrange, then it will become obligatory for the health officer to assume such treatment. We borrow the slogan of the Toledo Academy of Medicine: "Sell Health Protection to Your Patient." The same policy should prevail in pre-school examinations, and periodic physical examinations. It is your personal fault if you permit a clinic, a lay group or a health department to assume such practice. It's disheartening to read the representations made by members of the pro-

fession at the hearing on the Newton bill. The Newton bill is a most pernicious piece of legislation introduced in Congress, sponsored by social workers, nurses and jobseekers. The A. M. A. condemned the bill and opposed its enactment. The proponents received support from one state health officer and from several professors in medical schools who are without practical experience in general practice, nor have they a true conception of medical economics. They repudiate the profession by their statements, they are traitors to their fellow doctors and they abet pernicious policies. The time is here when they should be called to account, if not expelled from membership in our societies.

Several committee hearings were attended in Lansing. Chiro's, Osteos, Christian Scientists and Druggists raised questions and objections that had to be explained or adjusted. At present writing the bill is up for passage. The Osteos introduced a bill that would give them full rights of practice and a separate board. At the hearing they appeared several hundred strong. Our protest was duly recorded. We are unable to foretell the fate of this bill. And so legislative activity demands constant vigilance. We cannot voice the great indebtedness we all owe to Dr. Kiefer for his constant activity. More about that later.

The Bay City Post-Graduate Conference is scheduled for the 27th. Under difficulty a splendid program was prepared.

Speaking of activity, we urge every member to read the article on that subject published in this issue. It sets forth what your Society is doing for you and the dividends you receive from your dues.

March 22nd: Our two bills are "a special order of the Senate for consideration on March 26th." The Osteos are working hard to defeat them. As you read this the result will have been published in the daily papers.

And so ends another month.

OSTEOPATHS' SENATE BILL NO. 239

"To practice in all branches including medicine, surgery and midwifery . . . . and shall have the same rights as physicians of other schools of medicine."

Such is the purpose of the above numbered bill, now in the Public Health Committee of the Senate.

At a hearing the proponents were asked if the requirements of the present medical practice law were too high. The answer was, no. When asked why then a second, duplicating board when they sought the same rights to practice as are conferred on graduates of medicine the answer was: "To preserve our identity."

There is no question but what Osteopathic training is assuming a higher plane. That they are receiving good training in fundamentals is not to be denied. However, they have not yet attained the standard of the American Association of Medical Colleges. They do, however, desire full, unrestricted rights to practice medicine, surgery and obstetrics. There is but one answer: "Meet the present requirements of the Board of Registration in Medicine." There cannot be two standards. There should not be two boards. There can be no discrimination. All licentiates to practice medicine, surgery and obstetrics must comply with one, independent standard.

Until the Osteopaths perceive this, until their colleges become Class "A" schools, not until then, should they receive a license permitting unrestricted practice.

Opposition, on this ground, should be recorded and filed with Representative Culver, Chairman of the House Committee on Public Health, Lansing, Mich. If you have not done so, file your portest. Do not fail in this.

YOUR SOCIETY

A GENERAL OUTLINE OF ACTIVITY

In the February Journal the transactions of the Annual Conference of County Society Secretaries was published. This conference was planned to impart to the Secretaries and our members an intimate view of the broad scope of activity that characterizes the work of the American Medical Association. The published transactions reflect the tremendous amount of work that the American Medical Association is constantly directing for the ultimate benefit of the public and for the conservation and enhancement of the interests of the individual doctor. It is deplorable that a great majority of doctors are in ignorance as to what is being accomplished by our National Association. This conference sought to supplant that ignorance by presenting facts and records. It is sincerely hoped that the effort has resulted in causing our members to gain a true insight of the work of the American Medical Association.

There is a similar degree of ignorance and misinformation reflected in the minds of our members relative to their State Society and what it is achieving. It has therefore been deemed desirable to publish

this article imparting the scope and activity of your State Society. It is impossible to do so in minute detail. This attempt is confined to general facts.

MEDICO-LEGAL PROTECTION

Every member in good standing is entitled to and receives full legal protection in all malpractice suits or threats of suits. Our retained attorneys protect your legal rights and defend you, if necessary, through the last courts of resort.

An average of one suit or threat of suit is reported each day of the year. No doctor knows when some ingrate coming with an attorney may threaten suit or actually file suit against him. When such an experience confronts one, he will find a most sustaining comfort in the knowledge that his legal rights will be guarded by a most talented firm of attorneys advised in professional facts by the Medico-Legal Committee. Personal worries are banished. Legal expense is defrayed. The member receives protection without further cost. Such protection cannot be purchased elsewhere and in itself is worth to each member triple the amount of his state dues.

To accord this protection it is necessary to provide an ever alert and ready system that embraces a corp of attorneys, director, representatives, correspondents and record details. Numerous factors are concerned because the protection accorded is not self propelling. It is difficult to reflect the host of essential details, yet they are available twenty-four hours a day for each member. Many an interesting instance might be cited revealing the promptness and effectiveness of this protection which is a valuable membership benefit.

THE JOURNAL

All too frequently the Journal is received and read with no thought in regard to the details requisite to publish it. Our efficient Editor has well enunciated the editorial policy. The member is uninformed as to the amount of time given by the Editor in editing the original manuscript, reading galley proof, then, page proofs, writing editorials, classifying original articles, reviewing other Journals and books, remaining abreast of progress so as to promptly transmit to the members dependable facts and so prepare for you each month a Journal that is of intense value to every member as well as a credit to our Society. There is a vast amount of time and labor expended in editorial direction.

In addition to the editorial supervision there is a business side that must be conducted and directed ere each month's issue can be sent to a member. In 1928 the total cost of The Journal was $15,103.24. From your annual dues $2.50 per year is credited to the Journal fund. A total of $8,458.36 was thus received leaving a balance $6,644.88 to be acquired to defray all publication costs. This balance is acquired through advertising sales. Advertising space is not sold without effort. Constant contact with advertisers must be maintained and arguments advanced to secure renewal of expiring contracts. Then follows service to the advertiser which consists of securing copy each month, sending it to the printer, obtaining proof, sending the proof to the advertiser and upon its return to cause the printer to make the corrections. In addition, in asmuch as The Journal accepts no advertising that is unreliable or not in conformity with the rules of the American Medical Association Council on Pharmacy and Chemistry, all such copy must be carefully read and the Council's published reports examined to ascertain if the drug or preparation has been approved. We are not then through with our advertising affairs, monthly "dummy pages" and copy instruction must be prepared for the printer so that he can make up the advertising forms allocating each ad to its specified place for which the advertiser pays. Then, when the month's issue is mailed, entries of sales are made on our ledger, bills made out and remittances credited. To cite these details is easy, to execute them consumes much time and labor. Our advertising income in 1928 was $8,474.13. Were it not for this income the present Journal could not be sent to our members without an increase in dues of $2.50 per member.

The business details of The Journal do not end with the advertising department. An addressograph mailing list must be maintained, kept by railway train routes and verified by membership record. Doctors move, change office locations comparatively frequent so that there average a hundred "change of address" each month. The mailing list must be checked with the monthly reports of Secretaries. Following this, each month, these addresses must be transferred to 3,658 envelopes and arranged by train routes and then delivered to the printer where The Journal is inserted and delivered to the post office. Here they are weighed, postage computed and paid. The issue is then on its way. There remain a few un-noted details. A postal regulation requires that

stamps must be placed on each one of the some two hundred Journals sent to Grand Rapids members. Stamps must also be put on copies going to foreign subscribers. The Journal is entered as second class matter, consequently if the address is not correct or the member has changed address and failed to notify us the postal officers do not forward the Journal. Instead we receive a card notifying us of non-delivery. This necessitates writing to the County Secretary to ascertain the new address of the member. Such letters of inquiry average about eight to ten per month—just a small additional supervisory work. Then lastly two copies, a form card filled out and a check accompanying is sent to the Copyright Bureau in Washington to maintain copyright protection. Are we now finished? No. Authors desire reprints. A reprint order is sent with the galley proof—an estimate of reprint size is made and price quoted. Upon receipt of an order from the author, this is entered, transmitted to the printer and eventually the order is shipped to the author. Now come the printers bills which require checking, distribution to several Journal funds and issuance of vouchers to pay with proper ledger entries. One more thing, illustrations, prints and cuts are obtained from the printer and returned to the author. Eight copies of each issue are carefully laid aside for binding at the end of the year. Some fifty letters a month are written in addition to the correspondence already noted that deal with out of state men desiring a copy of a certain issue, requesting free insertion of some notice, proffering some article, free exchange copy for libraries and schools or offering trade credit for advertising space and maybe a few fool suggestions. Such is the monthly requisite of time, work and supervision that demands precision and is repeated with meticulous detail twelve times a year. Thus only is it possible to send to each member The Journal that he is receiving. Do you visualize or comprehend the work involved? It is registered to enhance your membership value and benefits.

SOCIETY RECORDS

County Secretaries remit and report monthly. The bulk of remittances are received during the first three months of each year.

Upon receipt of the report the amount of remittance is recorded in the general ledger, crediting two dollars to the Defense Fund, two and one-half dollars to The Journal and the balance to the general fund.

A member's record is important and is kept in a permanent card file drawer, by counties. This card imparts, name, age, address, school, degrees, date of receipt of current dues and number of membership certificate with date when it was mailed and lastly date upon which his name was reported to the American Medical Association.

Upon receipt of dues the following entries are made: ledger, record card, mailing list, monthly report to the American Medical Association and then his certificate is made out, addressed and mailed. This constitutes six separate entries for each name. Such handling is accorded to the some 3,500 members and demands accuracy in addition to many hours of time.

A monthly report is sent to the Chairman of the Medico-Legal Committee.

The minutes of the monthly meetings of the Executive Committee are written up and published in The Journal.

The annual and mid-winter meetings of the Council minutes are carefully edited and published in detail in The Journal, as are also the minutes of the annual meeting.

Minutes of the Joint Committee on Public Health and of the Legislative Commission are published in the Journal and are part of our permanent record.

In consequence of the above systematic and detailed recording the activities of our Society are preserved for all time.

In regard to finances, a very detailed set of books are kept. All receipts are in the form of checks or drafts and all disbursements are made by voucher. No money is handled. At the close of each year the books are audited by certified accountants and in the Secretary's annual report there is an itemized record of all receipts and expenditures. Sound investments in bonds are made of surplus funds at the beginning of the year. As funds are needed these bonds are sold, thereby yielding a higher interest earning than can be secured on daily balances at the bank.

In addition to our Society fund the office of Secretary handles the funds of the Joint Committee and issues vouchers for its monthly pay roll and expenses.

All in all some two thousand vouchers are made out and mailed during a year. This is but another feature of detail, consuming time, of Society activity requiring careful supervision.

POST-GRADUATE CONFERENCES

The history and growth of this Society activity has been imparted through The Journal and in annual reports. Our conferences are an important activity. About twenty are conducted each year and last from one to four days each. A tremendous amount of detail is exacted.

First, we must arrange a schedule of dates and localities. This is finally determined only after many letters to Councilors and County Society officers. Next, again by correspondence, we ascertain desired subjects and speakers for a given program. Then follow letters to speakers inviting participation and frequently we have to write several times as invitees often have previous engagements. Eventually, when the program is all lined up it is mimeographed and sent with a letter to all the doctors in the district. When possible the Secretary attends. A single conference completed, a letter of thanks is written to all the speakers and an expense voucher is sent to them.

Such are the mere details with omission of emergencies occasioned by securing a speaker to replace an original invitee who notifies us the last day that he cannot go; the providing of lanterns, newspaper publicity, transportation for some speakers, and recording of the Conference in The Journal.

JOINT COMMITTEE ON PUBLIC HEALTH EDUCATION

The object of the Joint Committee is set forth in the following declaration:

> "The function of the Joint Committee is to present to the public the fundamental facts of modern scientific medicine for the purpose of building up sound public opinion relative to the questions of public and private health. It is concerned in bringing the truth to the people, not in supporting or attacking any school, sect, or theory of medical practice. It will send out teachers, not advocates.

The committee is constituted from four representatives of the State Society, four from the University of Michigan and one each from the following state organizations: Detroit College of Medicine and Surgery, Dental Society, Nurses Associations, Department of Health, Tuberculosis Associations, Welfare Association, Board of Registration in Medicine, Wayne County Medical Society, Hospital Association, with President C. C. Little of our University as the active chairman of the committee.

A corps of some 300 speakers are enrolled, each is assigned from one to three medical subjects that form the basis for his public address.

Bookings are made by the extension division of the University. Meetings are sponsored by Parent-Teachers Associations, luncheon clubs, Granges and similar lay organizations.

During the year some 480 public meetings were sponsored. It must be perceived that this is an achieving form of public education.

ENDOWMENT FOUNDATION

Mindful of our educational obligation and realizing that the coming years must witness still greater extended efforts, on January 1, 1927, trust agreements were entered into creating an Endowment Foundation. Its purpose is indicated by the following paragraph of the agreements:

> The purposes of this trust are to pay the net income of the fund or funds held in trust on the written order of the Executive Committee of the Council of the Michigan State Medical Society, for the purpose of providing post-graduate instruction without fee for those designated by said Executive Committee, to conduct clinics and courses of instruction without fee in hospitals and medical schools in the state of Michigan, and to provide funds either by gift or loan to sustain such persons as designated by said Executive Committee, during the period of attendance on said post-graduate instruction or said clinics.

It is quite generally recognized by our medical schools, medical organizations and members of the profession that an outstanding obligation exists to provide post-graduate instruction opportunities for all the members of the profession. Collectively the entire profession is vitally concerned in the maintaining of a high type of medical practice on the part of all doctors of medicine.

Our science executes rapid strides of progress. Principles and theories of yester-year are displaced by the proven new facts and discoveries of today. Methods of diagnosis become more accurate and new methods of treatment evolve from the new facts uncovered. These conditions make it imperative that the recent grad-

uate, as well as the man advanced in the years of practice, shall have at their ready command opportunity of remaining abreast of the times and acquiring for themselves these accepted methods of treatment. Further, that they be encouraged to discard the old, less efficient methods for the more modern procedures. That unitedly we grasp each other's hand and reflect a profession that is efficient for service to all mankind. That, we feel, is the outstanding obligation of the profession that is efficient for service to all mankind. We can no longer condone scattered groups of outstanding professional men trailed by the mediocre or wholly incompetent. Well night 100 per cent capability is desired for all of our Michigan doctors.

Our State Medical Society has for years been mindful of such a responsibility. In fact it has been the leader, (and we say it with pride) in the field of State Societies in giving thought to the problem of post-graduate medical education. Through officers and committees we have concerned ourselves with the scientific programs of County Societies. Some 12 years ago we organized clinical teams that went from county to county meetings. Councilor district meetings were sponsored and capable speakers provided for their programs. Regional clinics were conducted. Three years ago District Post-Graduate Conferences were instituted and during the past year two such one or two-day meetings were conducted in each Councilor district. In addition a three-day clinic was conducted at the University hospital while endorsement and support has been accorded to several clinics arranged by hospitals and local organizations. We are justly proud of this activity and this policy that seeks to maintain our members in the van of medical progress.

However, we are not content with what has been accomplished; much still remains to be done. Increased activity is requisite. It is to that end that our Society, through its officers and Council, is directing its thought and effort. Illustrative of our enlarging scope of activity is the foundation. Sustained effort is being recorded to reach a million-dollar goal. Each month's efforts record progress and is but another activity to the members' interest while at the same time consuming the thought and time of the Secretary.

ANNUAL MEETING

Preparations for our annual meetings extend through each year. One meeting is adjourned and work immediately commences upon the next annual meeting. The details entailed relate to section officers, section programs, General Session programs, Council sessions, House of Delegates, delegate's credentials, Committee reports, Council reports, invited speakers, invited guests, Journal publicity, printed programs, local arrangements, section meeting rooms, lanterns, entertainment, hotels, exhibit space, sale of space, placement of exhibits, registration booth and clerks, section reporters and a myriad of minor details. Few comprehend the vast amount of time, correspondence and actual work necessary for a successful annual meeting. Your Secretary makes several visits during the year to the meeting city and appears on the scene two days before the first session and leaves a day after the last session. During the three-day session the hours of duty range from 18 to 20 each day. The annual meeting is an exacting taskmaster in providing for our members.

LEGISLATION

Our legislative interests have called for intense alertness and activity during the past two years and in the present session of the legislature. For sixteen months the Legislative Commission has been extremely active in the discharge of its duty. The Secretary is the Secretary of this Commission and the heavy recording, clerical and correspondence work had to be assumed. Sessions of the Commission have been frequently held and numerous conferences were held with state and legislative officials. An insight as to the extent of the work may be gained—that about two-thirds of one stenographer's time was devoted to legislative work. A file on this subject contains some five thousand items. It is quite patent that a large percentage of members have no conception of what the protection of their legislative interests entail. Further, they fail to appraise its value to their personal interests.

HIGH SCHOOL LECTURES

To extend our public health education, and also seeking to cause the coming generation to have a basis of sound knowledge as to scientific medicine, the state joins with the extension division of the state university in conducting during each year a series of lectures before high school students. The extension division arranges for the dates of these high school assem-

blies in eight of our larger cities. Each school has from 5 to 10 lecture hours during the school year. The State Society with the local County Society provide the speakers and formulate a synopsis of the talks scheduled. In the city of Detroit, the Wayne County Medical Society has assumed this work. The number of high schools where these lectures are given is being increased each year. This year we are making a trial in two so-called rural counties in order to make observation with a view of statewide extension for this educational movement.

SURVEY OF MEDICAL PRACTICE

In 1925 the Secretary's office conducted a survey of the state to determine the location of doctors in relation to population and public need. The findings were duly published. Lay organizations have recently become interested in the subject of available medical service. There is much discussion by the Grange and even some effort is being made to provide medical services to rural districts. At the last Council meeting the Secretary recommended a re-survey of the state. The Council has directed such survey be made during 1929. In consequence thereof additional work is bestowed upon the executive office.

LAW INFRACTIONS

There is ever cause for complaint on the part of a doctor when he finds in his community some one or more individuals violating the medical practice laws in Michigan. Enforcement of law is the duty of constituted enforcement officers. Our Society is not a policing power of the state. However, because of failure of state and county officers to enforce the law, our members have expressed the desire that our Society shall assume such a role in some reasonable degree. In consequence of such expression the Council has directed to so proceed. In 1928 some fifteen complaints were filed and prosecution secured. Thus far in 1929 we have attained two convictions, one awaiting trial and nine cases under investigation. Here again your Society is rendering service and benefiting every member.

STANDING COMMITTEES

The following standing committees achieve definite results and clear their activities through the Secretary's office:

Public Health—Co-operating with state and local health agencies.

Tuberculosis—Uniting with and advising the State Anti-Tuberculosis Society.

Civic and Industrial Relations—Activity is designated by its name.

Medical Education—Complying with the requests of the American Medical Association Council on Medical Education.

Medical History—Compiling a medical history of Michigan.

Nursing Education—Joining with a similar committee from the Michigan Hospital Association seeking to solve the problem of nursing education.

An exceptionally large volume of effort thus expended accomplishes material and personal benefit for every member.

CRIPPLED CHILDREN COMMISSION

Liaison has been made with this state organization. Two of our members are ex-officio members of the Commission. It is proposed to conduct county clinics under the auspices of county societies and arranged through the office of the State Secretary. This evidences a new activity that is for the personal interest of a member.

SUMMARY

The attempt has been made in the foregoing to impart in generalities the functions and activities embraced by your State Society and to convey to each member just how and to what degree it is concerned in the enhancement of individual and collective interests. It is impossible to set up in words a true and all inclusive citation of what is involved in administrative work. Unless absolute contact is had with all the phases of the work it is difficult to comprehend and realize the sum total of effort expended. The desire is paramount that each member should perceive that his State Society is a live, going, aggressive and progressive organization. That it renders personal service. That membership is a valued asset. It is so, because the Councilors, Committees, President and Secretary are ever alert striving constantly and persistantly to achieve the ends deemed so desirable. The scope of work, as time passes, extends further and further embracing new and varied features. They ever concern and revolve about the individual doctor. The individual doctor should perceive that the returns upon his annual dues are in dividends several times their amount. His perceptive vision should also vizualize the fact that those in whom trust is reposed are commendably acquiting themselves of that trust. Continued and sustained support is merited and should be forthcoming in full degree. It is your State Society—

existing, representing and achieving solely for you—its member.

PLEDGED ACTIVITIES FOR 1929

1. Legislation.
2. Post-Graduate Conferences—District.
3. Endowment Foundation.
4. Establishing Contact with Michigan Hospital Association for Discussion of Nursing Problem and Hospital Survey Committee — Recommendations.
5. Prosecution of Illegal Practitioners.
6. Annual Meeting Program.
7. Two or Three-Day Clinic at Ann Arbor and Detroit.
8. Upper Peninsula Clinics—Four.
9. Crippled Children Clinics.
10. Co-operation with State Board of Health in Immunization Campaign.
11. Survey of State as to Available Medical Services in Communities.
12. Publication of History.
13. Joint Committee on Public Health Education and High School Lectures.
14. Women's Auxiliary.
15. The Journal.
16. Medico-Legal Defense.

EATON COUNTY

The officers for the Eaton County Medical Society for the year of 1929 are: Dr. K. A. Anderson, Charlotte, President; Dr. H. Hoover, Grand Ledge, Vice President; Dr. Carleton Dean, Eaton Rapids, Secretary and Treasurer.

We had a very successful meeting in January, having had a 60 per cent attendance. Dr. William Behen of Lansing presented a very interesting case of parotitis and gave us a very instructive talk concerning same. We also discussed the way in which the A. M. A. is serving the individual physician and presented several of the books and magazines that are published by the society.

—Carleton Dean, Secretary.

LENAWEE COUNTY

The regular meeting of the Lenawee County Medical Society was held at Dobbin's Tea Room in Adrian, on the evening of February 21st. Dinner was served at seven, after which a short business meeting was held, with the new President, Dr. R. G. B. Marsh in the chair.

It has been planned to have a series of symposia this year, the first to be three papers on obstetrics. The first of these on "Management of Labor and Puerperium," was given by Dr. B. C. Carrol of Toledo, followed by charts and lantern slides. The paper was very instructive and intensely practical, and aroused the most extended discussion which has been given any paper in a long time, especially in the way of questions asked Dr. Carrol. The charts were very illuminating to any who may have thought that the last word on the subject has been said in America, as the death rate is the highest in this country of all the countries from which statistics can be obtained except Chile. Such figures gave us a start, and we all went home with the purpose to do our bit toward lowering that death rate. Your correspondent feels that this was one of the most profitable meetings that this society has held in a long time.

C. H. Westgate, Secretary.

CALHOUN COUNTY

The February meeting of the Calhoun County Medical Society took place at the Kellogg Inn, Tuesday evening, February 5, 1929.

Thirty-six fellows of the society partook of the dinner, in honor of our guest, Dr. Channing W. Barrett, of Chicago.

At 7:45 the President, Dr. R. V. Gallagher, called the meeting to order. The Secretary's report, as printed in Bulletin, Vol. XII, No. 2, was approved as printed. The bills for current expense were read and ordered paid.

The Secretary made a brief report of his recent visit to the A. M. A. headquarters in Chicago, and called attention to the efficiency of this organization, and to some special features for rendering service to the members which but few doctors use or even are acquainted with.

Dr. Wilfred Haughey introduced the essayist, Dr. Channing W. Barrett, Professor of Gynecology at the University of Illinois Medical School, whose paper on "The Treatment of Fibroids in Relation to the Pathology" was listened to with the keenest interest by al present.

His simple statement of facts in connection with the subject of the treatment of uterine fibroids, whether by surgery or radiology left no one in doubt as to the proper method of handling these cases. No one could listen to him without a feeling that he was a master of his subject, and it afforded everyone a great amount of satisfaction to hear this subject so thoroughly covered.

The discussion which followed was timely and interesting, and, judging by the number who talked or asked questions, the subject was one of quite general interest. Among those who took part were Doctors Case, Kolvoord, Cooper, Rosenfeld, Gilfillan, Giddings, Stone, Hafford, Kingsley and Zelinsky.

Meeting closed by a rising vote of thanks to Dr. Barrett. Members present, 45.

MONROE COUNTY

Monroe County Medical Society met at the Park Hotel, Monroe, February 21, 1929. Dinner was served at 6:30 p. m. Dr. L. M. Coulter, Lansing, of the State Department of Public Health, spoke on "Public Welfare and Health Promotion," and expalined the county health department project. The society went on record as approving a project for Monroe County. To further it, a public health committee was appointed, consisting of Doctors J. A. Humphrey, H. L. Meck, J. H. McMillin.

Florence Ames, Secretary.

BAY COUNTY

Bay City, Michigan, February 4, 1929.

Hon. Fred W. Green,
Governor,
Lansing, Michigan.
Sir:

In accordance with action taken by the Bay County Medical Society with reference to the care of mental defectives and the prevention of an increase in the number of feeble-minded and men-

tally defective persons in the state of Michigan, I am enclosing herewith copy of a resolution passed at a meeting of the Bay County Medical Society for your consideration.

The members of the Bay County Medical Society wish to be clearly understood in this matter as sponsoring a legislation intended for the correction of a social evil on a scientific basis. Their action is not to be considered as an effort to institute birth control, but purely an attempt to aid in correcting a social evil by a specific means.

Respectfully,
BAY COUNTY MEDICAL SOCIETY,
By: A. D. Allen.

COPY OF RESOLUTION

WHEREAS, approximately thirteen thousand people are at the present time confined in state institutions for the feeble-minded, insane and epleptic in the state of Michigan,

WHEREAS, approximately two thousand patients are awaiting admittance to the above mentioned institutions,

WHEREAS, the present situation has lacked proportions due to a lack of foresight on the part of those administering state affairs in the previous generations,

WHEREAS, the problem for future generations will be greatly multiplied unless some action directed at the cause is taken,

WHEREAS, the burden of this situation is rapidly reaching such proportions as to become a menace to the economic welfare of the state,

WHEREAS, feeble-mindedness and defective personality are the causative factors in a large proportion of the present indigent population of county and other charity organizations,

WHEREAS, the Governor of the state of Michigan has given his personal interest to the present conditions existing in the state of Michigan with reference to the care and housing of feeble-minded, insane and epileptic patients.

WHEREAS, the Bay County Medical Society, composed of practicing physicians practicing their profession in the County of Bay, is deeply interested in the problem presented and desirous of expressing their commendation to his excellency, the Governor of the state of Michigan, for his human attitude in dealing with this problem,

WHEREAS, the Bay County Medical Society is interested in bringing about a solution of the grave problem presented because of the alarming increase in the number of feeble-minded, insane and epileptic persons in the state of Michigan,

WHEREAS, the said Bay County Society is convinced that segregation alone will not bring about a solution of the problem, now therefore, be it

RESOLVED, by the Bay County Medical Society, in meeting assembled January 14, 1929, that the committee of said society be instructed to write to his excellency, the Governor of the state of Michigan, an expression of the commendation of the Bay County Medical Society for the humane and sincere attitude of his excellency, the Governor, in seeking to provide adequate housing facilities and accommodations for the feeble-minded, insane and epileptic patients in the state of Michigan; be it further

RESOLVED, That said committee communicate to the Governor the desire of the Bay County Medical Society to co-operate in every way possible with the Governor in bringing about a solution of the problem; be it further

RESOLVED, That said committee communicate to the Governor the following recommendations:

(1) That a committee made of technically trained persons, part of whom should be chosen from individuals not connected with state institutions at the present time, to make a survey of the present situation with reference to this problem to recommend legislation regarding the following:

(a) An examination of all children in the schools of the state of Michigan to determine their mental condition.

(b Strengthening the laws governing marriage so as to eliminate the propagation of the mental defectives.

(c) Marriage of mental defectives permissive only on submission to sterilization.

(d) To provide a more workable sterilization law for mental defectives.

(e) Revision of law governing persons afflicted with venereal diseases.

BAY COUNTY MEDICAL SOCIETY,
(Signed) A. D. Allen, M. D.
P. R. Urmston, M. D.
J. W. Gustin, M. D.
Jas. Donnelly, LL.B.

MUSKEGON COUNTY

In answer to your letter of February 26th, the following are the present officers of the Muskegon County Medical Society:

Dr. F. N. Morford, President; Dr. Pitt Wilson, Vice President; Dr. R. J. Douglas, Secretary-Treasurer; Dr. C. J. Bloom, Delegate to State Convention; Dr. V. S. Laurin, Alternate to State Convention.

R. J. Douglas, Secretary.

MACOMB COUNTY

The March meeting of the Macomb County Medical Society was held on March 4th at 12 o'clock noon, at the Colonial Hotel, Mt. Clemens.

After enjoying a hearty luncheon the members were called to order by the President, Dr. Bower.

The President urged the members to write letters of protest to Senator Alex Cowan regarding the Chiropractor Bill which passed the Legislature and which is to be brought to the Senate shortly. The Secretary was instructed to write a similar letter of protest on behalf of the society.

The Secretary read communication from the Wayne County Medical Society, inviting the members to attend the Beaumont Lectures on March 25 and 26.

Dr. Wm. N. Braley, Chief Officer of Health of Highland Park, and attending Pediatrician of Highland Park General Hospital was the speaker of the day. He gave a very instructive, practical and interesting paper on "Obscure Fevers in Children."

There was an interesting discussion following the paper, which was well received.

The meeting was adjourned at 2:15 p. m.

Joseph N. Scher, Secretary.

HOUGHTON COUNTY

At our regular Annual Meeting held January 8, 1929, election of officers for 1929 followed a 6:30 banquet. The folowing officers for 1929 were elected: President, Dr. Alfred Labine, Houghton, Mich., Vice President, Dr. W. A. Manthei, Lake Linden, Mich., Secretary-Treasurer, Dr. T. P. Wickliffe(Lake Linden, Mich., Councilor for 3

year term, Dr. K. C. Becker, Mohawk, Mich., Delegate to State Meeting, Dr. W. H. Dodge, Hancock, and Alternate, Dr. W. A. Manthei. Social hour followed.

T. P. Wickliffe, Secretary.

Following is the program of the Michigan State Medical Society Post-Graduate Conference, Tenth District, Bay City, Michigan:

2:00 P. M.—Treatment of Skull Fractures,
F. C. Warnshuis, M. D., Grand Rapids.

2:45 P. M.—Proctology,
J. Hirschman, M. D., Detroit.

3:15 P. M.—Cranial Injuries in the New Born,
Thomas D. Gordon, M. D., Grand Rapids.

4:00 P. M.—X-ray, Radium and Surgery in Cancer,
Thomas E. Jones, M. D., (Crile Clinic),
Cleveland, Ohio.

4:30 P. M.—Acute and Chronic Otitis,
Austin A. Hayden, M. D., Chicago, Ill.

5:00 P. M.—Treatment in Cardiac Disease,
Richard M. McKean, M. D., Detroit.

6:30 P. M.—Dinner.

8:00 P. M.—Organizational Activity,
F. C. Warnshuis, M. D., Grand Rapids.

8:30 P. M.—The Causes and Differential Diagnosis of Paraplegia,
L. J. Pollock, M. D., Chicago, Ill.

9:30 P. M.—Prenatal Care—Moving Pictures,
Alexander M. Campbell, M. D., Grand Rapids.

KALAMAZOO COUNTY

The regular meeting of the Academy of Medicine was held February 19th at the rooms in the library. Dinner was served at 6:30.

The program for the evening followed immediately and the business session held afterward.

Judge George V. Weimer gave an illuminating discussion on "Cross Examination." He made clear to us the function of this procedure in court and pointed out the significance and weight it carries to the jury or judge.

Dr. C. G. Jennings of Detroit gave a very interesting discussion on "Acute Respiratory Infections," emphasizing especially the care of pneumonia patients.

The business meeting was called to order by the President, W. E. Collins.

The minutes as printed in the bulletin were approved.

No reports from standing committees.

Special committee reports.

Dr. Stewart, Chairman of the City Clinic Committee read the following letter:

"To Whom This May Concern;

"The members of the Kalamazoo Academy of Medicine have become convinced that there is an abuse of the so-called free medical, surgical and health clinics which are being held at regular intervals in the city of Kalamazoo and vicinity. The physicians maintain that they, no more than other business and professional people, should be called upon to give their time and services free of charge indiscriminately. With this end in view the following committee report was adopted in the regular meeting of the Academy. This is the report of a committee appointed by the Academy to investigate free clinics; see report in enclosed Bulletin.

"From now on the physicians will not be expected to examine, prescribe for, or otherwise direct in health promotion, at these clinics of any persons except those coming under classes A. B. and C. This includes tonsils and adenoids, tuberculosis and child welfare clinics.

"The physicians of Kalamazoo and vicinity stand ready to conduct such public and educational clinics as from time to time seem desirable and also to aid in the care of the city's poor and permanently indigent in these clinics.

"Signed,

"L. H. Stewart,
"W. G. Hoebeke,
"L. E. Westcott."

Dr. Crum moved that the letter be sent to the heads of the various clinics, that they be given one month for charting and tabulation of patients and that if at the end of the month patient has no card indicating his or her status, the doctor refuse to give his services. Seconded by Dr. Pratt. Carried.

Dr. Stewart also read a letter that was written to the Battle Creek Sanatarium and College regarding the recent Clinic at Milwood School. Dr. Westcott moved that the letter be sent as read. Seconded and Carried.

Meeting adjourned.

GRAND TRAVERSE-LEELANAU CO.

Regular meeting of the Grand Traverse-Leelanau County Medical Society was held at the J. D. Munson Hospital on February 5, 1929.

The membership voted to request a District Conference at Traverse City in the early part of June during cherry blossom time. It was felt that a trip through the peninsula orchards would be a treat to our visitors.

The Secretary gave a report on the Conference of Michigan Secretaries which was held at Chicago. The report was apparently appreciated by all the members present.

Dr. H. B. Kyselka presented his series of colored lantern slides on Venereal Disease, which he is using for lay talks.

E. F. Sladek, Secretary.

Regular meeting of the Grand Traverse-Leelanau County Medical Society was held at the J. D. Munson Hospital on March 5, 1929.

After some discussion, the Secretary was instructed to answer the questionnaire from the Civic and Industrial Relations Committee.

The invitation from Wayne County Medical Society to the use of their club rooms in Detroit was approved. Thank you Wayne.

The speaker of the evening being unable to attend, President Inch called on all the members present to give a report of the most interesting case they had during the past month. Dr. G. W. Gauntlett presented a case of severe acute glaucoma following corneal ulcer and iritis; Dr. L. R. Way reported a case of psyconerosis characterized by continuous air-swallowing; Dr. F. P. Lawton related his experiences with deep therapy X-ray; Dr. T. W. Thompson reported on a possible encephalitis lethargica.

The meeting adjourned at a late hour.

E. F. Sladek, Secretary.

LIVINGSTON COUNTY

The February meeting of the Livingston County Medical Society was held Wednesday, February

27th, at the Hotel Livingston at Howell. After a very splendid steak dinner, President Huntley opened the meeting and after the usual formalities he extended an invitation to the Society to attend the opening of the new unit at the T. B. Sanatorium. The name of Dr. W. E. Fawcett of the Michigan State Sanatorium was presented for membership and referred to the membership committee. Dr. Huntley then introduced Dr. L. D. Coulter of the State Department of Health. Dr. Coulter talked at large upon the recent proposal of establishment of County Health Units, after which the meeting was thrown open to discussion. Upon the motion of Dr. H. L. Sigler a vote for the adoption for such a movement was postponed until the next meeting. The meeting was adjourned.

The men from this county are proving very enthusiastic in their support of these meetings, there being only two absent at this session.

THE DOCTOR'S LIBRARY

Offering Suggestions and Recommendations

THE INFANT AND YOUNG CHILD—Its care and feeding from birth until school age. A manual for Mothers. By John Lovett Morse, M. D., Edwin T. Wyman, M. D., and Lewis Webb Hill, M. D., of Harvard Medical School and Children's Hospital, Boston, Mass. 12 mo. of 299 pages, illustrated. W. B. Saunders Company, Philadelphia and London, 1929. Cloth, $2.00 net.

Mothers are evincing a more intelligent interest in the rearing of their children. They read and hear a lot about calories, vitamins, rickets and ultra-violet light. They are curious as to what it is all about and often in seeking for information they get mis-information. This little work is an authoritative work on the subject on the rearing of the infant and young child. It embraces the care and feeding from birth until school age. It is written in simple non-technical language and takes up the topics in which the intelligent mother is apt to be vitally interested. The pediatrician and the general practitioner will find it a very valuable aid in their professional work in the matter of educating mothers who are usually the nurses.

A HANDBOOK OF CLINICAL PATHOLOGY—Frank Scott Fowweather, M. D., M. Sc. Liverpool, with a foreword by Sir Berkeley Moynihan. 18 illustrations. P. Blackiston's Son & Co., Philadelphia, Pa. Price, $3.00.

This little book contains a course of lectures on clinical chemical pathology delivered to senior students of the Leeds University Medical School. There are 15 lectures in all, including such subjects as "Acid Base Balance of the Blood," "Glycosuria and Diabetes," "Renal Function Tests," "Liver Function Tests," "Gastric Function," "Vitamins and Deficiency Diseases," "Ossification," "Calcification Calculus Formation," "Basal Metabolism Anoxemia." This work is a sort of pioneer in a subject that has not yet found expression in text books.

PEDIATRICS FOR THE GENERAL PRACTITIONER—Harry Monroe McClanahan, A. M., M. D., Professor of Pediatrics Emeritus, University of Nebraska; Member of the American Pediatric Society; Ex-President of the Nebraska State Medical Association. 230 illustrations. J. B. Lippincott Company, Philadelphia and London. Price, $6.00.

The subject of pediatrics has become a highly specialized department of medicine, yet the general practitioner must always continue to be the first line of defense, so to speak, in children's disease. He is the one who, as a rule, first sees the child, and in a great many instances the condition yields to his ministrations. Complications in the course of illness constitute as a rule the work of the specialist. This volume of over six hundred pages has been written to meet a distinct field, namely, diseases of children as usually met by the general practitioner. One of the features of the work is a chapter on the "Normal Human Infant from Birth to Adolescence." This chapter deals with both training and feeding. The work is well illustrated, printed in good clear type, and well indexed. There are convenient bibliographies at the end of the chapters for readers who desire to pursue the subjects more fully than are treated in the text.

A COMPEND OF DISEASES OF THE SKIN—Jay Frank Schamberg, A. B., M. D., Professor of Dermatology and Syphilology Graduate School of Medicine, University of Pennsylvania. Eighth edition, revised and enlarged with 126 illustrations. P. Blackistone's Sons Co., Philadelphia. 1012 Walnut St. Price, $2.00.

P. Blackiston's Sons' Compends are too well known to need any lengthy description. They are authoritative, concise accounts of medical knowledge up to the date of their publication. This little work on the skin is no exception. It deals with the skin conditions which are apt to be met with in the general practice of medicine. The only addition to the present work is a review of the treatment of syphilis of the nervous system. The illustrations are good and as informative as it is possible to have them in black and white. While these books do not and are not intended to displace the larger works on the subject, they have their place as convenient summaries or works of reference.

THE DIABETIC LIFE, ITS CONTROL BY DIET AND INSULIN—A concise manual for practitioners and patients. By D. D. Lawrence, M. A. M .D. M. R. C. P. (London) Chemical Pathologist and lecturer in chemical pathology. King's College Hospital. Fourth Edition with 12 illustrations. P. Blackiston's Son & Co., 1012 Walnut St., Philadelphia, 1928.

The author of the book brings the latest and most modern treatment of diabetes, by diet and insulin, within the scope of the general practitioner and the patient. By means of a very simple and accurate diet scheme, called Line-ration diet, he enables the general practitioner to start accurate treatment at once and enables the patient to arrange his diet so as to have a variety of foods without the complicated calculations of diets and food values, as has been known in the past treatment. Some chapters are written especially for the doctor, while still others are written so that they are readily understood by the patients.

The author gives a short history of the disease; compares the normal and the diabetic metabolism in a very interesting and thorough manner; dis-

cusses the symptoms of the disease, its causes and the effects of insulin upon it. The Line-ration diet is taken up very thoroughly and is presented to the reader in a manner very easily understood.

INTERNATIONAL CLINICS—A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, paediatrics, obstetrics, gynecology, orthopaedics, pathology, dermatology, opthalmology, otology, rhinology, laryngology, hygiene, and other topics of interest to students and practitioners. By leading members of the medical profession throughout the world. Volume IV. Thirty-eighth Series, 1928. J. B. Lippincott company, Philadelphia and London.

This well known volume contains 25 chapters on medical subjects from the pen of leading members of the medical profession. It is a very excellent book an deach of the chapters contains valuable information which makes it impossible to pick out any special article.

IMPERATIVE TRAUMATIC SURGERY WITH SPECIAL REFERENCE TO AFTER-CARE AND PROGNOSIS—C. R. G. Forrester, M.D., F.A.C.S. Consulting Surgeon, Chicago General Hospital; 8th Vol., extra cloth with 598 original illustrations. Price $10 net. Paul B. Hoeber, New York.

This monograph is based on the author's experience of twenty-six years, during which time his work was confined entirely to traumatic surgery. Special care has been given to the immediate treatment and after-care of traumatic conditions. The treatment of fracture and other bone injuries naturally occupies a large space in the book. Besides line drawings and halftones the work is profusely illustrated with roentgenograms wherever a roentgenogram may be used to advantage. The work will therefore appeal to the Roentgenologist, as well as to that comparatively recently developed specialty industrial survey. A commendable feature is the emphasis placed upon the importance of clinical records particularly of fractures with many illustrative examples. Methods of examination of patients before general and also before local anaesthesia are described in detail.

ROENTGENOLOGY THE BORDERLANDS OF THE NORMAL AND THE EARLY PATHOLOGICAL IN THE SKIAGRAM—Alban Kohler Prof. Dr. Med. Wiesbaden. E-President German Roentgen Society. Rendered into English from the Fifth German Edition by Arthur Turnbull M.A., B.Sc., M.B., Ch.B. (Glasgow). Illustrated by radiographs and line drawings. Pages 550. Price $14. William Wood & Co. ,New York.

Dr. Kohler's work was originally published in 1910, since which time it has gone through five editions in German; the present volume is a translation of the fifth German edition. The object of the book as expressed by the author in the first edition is that of adviser on those findings which exhibit or appear to exhibit slight and not particularly noticeable divergences from the normal anatomical picture. In other words. it deals with the borderline of disease as revealed by the X-rays. This of itself should be enough to recommend any work to the medical profession and more particularly if it has been well performed. Kohler's work has been so long a standard with roentgenologists and so favorably known that nothing the present reviewer might say could add to it. The work, now that it is in such a splendid readable translation, will commend itself to a wider clientele, namely, surgeons and internists in the broadest sense. A member of our own State Medical Society, Dr. James T. Case, who has written the American preface says, "There is no other work in any language which contains all the facts pertaining to radiographic interpretation so painstakingly and patiently collected, digested and organized for ready and easy reference as in this book." The reviewer feels that the work is perhaps the best one in existence on anatomy from the X-ray viewpoint. It bears the same relation to well made radiographs of the osseous and soft tissues of the body as the text books on anatomy to the actual dissections. The book is not as profusely illustrated with radiographic reproductions as one might expect. Positives even as halftones are unsatisfactory as compared with the original radiographs (negatives); consequently we have a didactic employment of line drawings which the author uses wherever they serve his purpose. The work is printed on a good grade of paper and in clear type. The format is such as to make a convenient as well as useful work of reference for the roentgenologist, internist and surgeon, as well as self-instruction for the physician who is in process of acquiring a knowledge of the subject.

MORE DIGGING NEEDED TO PROVE MAN'S PAST

A great need for further excavation at some of the famous sites where important discoveries of ancient men have been made was urged by Dr. Ales Hrdlicka, of the Smithsonian Institution, addressing a joint meeting of the American Association for the Advancement of Science and the American Anthropological Association at the annual meeting of both.

Scientists spend much time examining a few rare fossilized fragments of skulls and other bones and argue endlessly just how long man lived on earth and what sort of creature he was at first. Meanwhile the sites where the isolated specimens came from and which at any moment might yield more bones, that would settle the uncertainties and clear up deadlock arguments, are neglected. Men will argue and even quarrel violently, but no one undertakes the slow, uncertain, further labor," Dr. Hdrlicka pointed out.

For nearly twenty years, he said, not a trace of work has been done at the stream bed in Java which yielded the unique bones of the Pithecanthropus erectus, the oldest creature resembling man that has ever been discovered. This creature with a thigh bone like that of a man and a skull cap like an ape is estimated to have lived 500,000 years ago. Additional evidence is badly needed, Dr. Hrdlicka pointed out, to prove once and for all that the thigh bone and skull really belong to the same creature, and whether he was ape or human. But there is not even a supervision of the banks of the stream to salvage any specimens that might be washed out of the banks from time to time.

Less than half a day's journey from London, lies the site at Piltdown, where other important and much discussed relics were found. They consist of fragments of two skulls and a part of a lower jaw, and the being they are believed to represent has been named the Dawn man, or "Eoanthropus". He is held by some scientists to be almost as old and important as the Javanese individual. One scientist after another visits this accessible site, Dr. Hrdlicka said, but with the exception of one venerable retired British scientist, Professor Smith Woodward, no one in 15 years has done any work there to find more specimens. Yet, this is one of the most unsettled points of man's prehistory, because the fragments of the skull seem to belong to a being with a head form

and a brain far in advance of his time, while the lower jaw and the canine tooth are almost those of an ape.

In Germany, near Tubingen, at least fourteen fossil primate teeth were discovered back in the last century, Dr. Hrdlicka continued. These teeth were of the Tertiary geological period, and belong to anthropoid apes, but so near to human are some of them that the ape must have been close to a primitive man. But since that discovery there is not a report of any further attempt to find out more about these man-like ape creatures.

"The fallacies that have sprung up and flourished in connection with the inadequate specimens of oldest man are the sore spots of prehistory," Dr. Hrdlicka declared. "They retard the progress of man's knowledge of ancient man, and the arguments and uncertainties are taken by people not acquainted with the conditions as weaknesses of the science. Facts and speculations become confused, and so the value of the facts which have been firmly established regarding man's ancestry is diminished. There is urgent need for more sound labor in the field and less speculation."—Science Service.

CREATIVE PROCESS ANALYZED BY PSYCHOLOGIST

The scientist and poet employ essentially the same mental and emotional processes in creating a theory or a sohnnet, according to Dr. Eliott D. Hutchinsonfi of the University of Rochester. Dr. Hutchinson has concluded an investigation in England at the University of Cambridge in which he has analyzed the creative methods and practices of famous artists, authors ,scientists, and musicians. Among those ho informed him of their creative wethods were such thinkers as Arnold Bennett, Bertrand Russell, William Butler Yeats, Eden Phillpotts, Aldous Huxley, W. Somerset Maugham, and Sir James Flinders Petrie. Early phases of the creative process are marked by an insistent restlessness and tension which may persist for months or years if the thinker is thwarted in creative expression, Dr. Hutchinson says. What comes first is a problem or puzzle involving discomfort. Then comes voluntary application with great effort. After this period without conscious thought, and finally a solution, the last stage being usually sudden. "Many creative ideas arrive when the individual is engaged upon matters irrelevant to his work, usually during a period of emotion or deep absorption in distracting events," Dr. Hutchinson argues. "On such an occasion, which is really a momentary period of mental dissociation, creative ideas seem to come in floods. most of them are fragmentary though clustered about one kep-idea, many are discovered on the fringe of conscieousness, and are irrecoverable when lost, and many involve a feeling of impersonality. The scientist in his creative mood resembles the artist. He waits days, perhaps years, sometimes gathering relevant facts, sometimes merely relaxing from labor. Then one day in a moment of forgetfulness an dillumination the looked-for hypothesis, the desired generalization comes."

Too litttle is known about the mental and emotional process by which the world's new ideas are evolved, its art works produced, its inventions achieved, Dr. Hutchinson believes. The field has been a neglected one in psychological research.—Science Service.

DRUG ADDICTION DECREASING FEDERAL SURVEY SHOWS

Drug addiction in the United States is greatly decreasing, in the opinion of Col. L. G. Nutt, Deputy Prohibition Commissioner, Washington, D. C., in charge of narcotics.

Colonel Nutt so testified before the House Appropriations Committee this week, according to hearings just released. A survey made by him in all territory west of the Mississippi in which he interviewed state attorneys, police officers, field prohibition agents, federal judges, an dothers, convinced him, he said, that the habit was becoming less and less common.

Colonel Nutt denied emphatically that prohibition of alcoholic liquor was increasing the number of narcotic addicts in this country.

"It is not true," he said. "Th etwo don't go together. A man addicted to narcotic drugs will rarely turn to liquor, or vice versa. We have made a careful study of that through the Public Health Service.

"You will occasionally find a man who will take morphine and cocaine, but not one who takes morphine and cocaine and whiskey."

Nutt estimates that there are 25 big drug syndicates engaged in the traffic in the United States. He said that the cost of morphine in Boston was $22.50 per ounce, when purchased wholesale in hundred ounce lots. By the single ounce it costs $35 an ounce. To the trade, a dollar for one to four grains in cube form. The price in New York, he stated, was $12 to $16 an ounce, wholesale ,and $30 to $35 an ounce in single ounces.

Dr. James Doran, prohibition commissioner, said that not only was drug-addiction decreasing, but that fewer and fewer young persons were becoming addicts in the last few years.

"Data—compiled datd—show," he said, "that the age of the narcotic addict is increasing. The proportion of fresh addicts is lessening, the age of addiction increasing. Every other statement I have ever seen with respect to whether addiction is increasing or decreasing is an opinion, but this is a fact."—Science Service.

VOMITING OF PREGNANCY

John P. Gardiner discusses vomiting of pregnancy. He concludes that the vomiting of pregnancy is a self-limiting disease. Vomiting, as with yawning, respiration, urination and defecation, is a mixed primordial function. Menstruation is associated with an increased intestinal gradient and pregnancy is associated with a decrease, possibly the result of a substance given off by the chorion of the zygote. The time of greatest activity of the chorion corresponds to the time of the greatest frequency of the vomiting. Experimental work on dogs has shown that the pathologic changes induced by the vomiting of pregnancy are difficult to distinguish from those of inanition. The human being, because of the upright position, is the only mammal subject to the vomiting of pregnancy. The immediate cause of death is probably exhaustion. The value of the inverted ventral posture is that it separates the genital and intestinal tracts. The employment of sedatives is logical. Enterocylsis is safer and is a more rational guide to the amount of fluid needed than intravenous administration or hypodermoclysis. The inverted ventral method has been used with success in three cases.—Journal A. M. A.